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REPORT OF THE SECRETARY OF THE INTERIOR

to the

ENDANGERED SPECIES COMMITTEE

**Related to the
Application by the
Bureau of Land Management
for Exemption from the Requirements of
Section 7(a)(2)
of the Endangered Species Act**

**In Order to Hold Timber Sales on 44 Tracts
Remaining in the
Bureau's 1991 Program in Oregon**

April 29, 1992

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EXECUTIVE SUMMARY

INTRODUCTION

On September 11, 1991, the Bureau of Land Management filed an application with the Secretary of the Interior, as Chairman of the Endangered Species Committee, seeking exemptions from Section 7 of the Endangered Species Act to permit the Bureau to hold timber sales on 44 separate tracts remaining in the Bureau's 1991 timber sales program in Oregon. [BLM Exhibit 158] The 44 sales are the subject of the application for exemptions and of this report.

Subsequent to a determination that all threshold criteria required by the Endangered Species Act had been met, an evidentiary hearing was held concerning the application for exemptions. The primary parties were the Bureau of Land Management, and the Fish and Wildlife Service. Other intervenors included the Northwest Forest Resource Council, the Portland Audubon Society, the Association of Oregon and California (O&C) Counties, the Oregon Lands Coalition, and the State of Oregon (limited intervenor). Initially, the Environmental Protection Agency was granted limited intervenor status; however, the Agency withdrew from intervenor status at the beginning of the hearing.

This report provides a summary of the evidence that was presented in the evidentiary hearing before Administrative Law Judge Harvey Sweitzer, from January 8-30, 1992, in Portland, Oregon. This report is based on the record of that hearing, and calculations of effects of the 44 sales (individually or collectively) are based on data presented in the hearing record. The 44 sales are analyzed collectively and individually. Information on individual sales is summarized in Table 4.10 which appears both in Chapter 4 and at the end of this Executive Summary.

DECISION OF THE ENDANGERED SPECIES COMMITTEE

The Endangered Species Act requires that the Endangered Species Committee shall grant one or more exemptions if, by a vote of not less than five of its members voting in person, it determines that:

- There are no reasonable and prudent alternatives to the agency action.
- The benefits of the agency action clearly outweigh the benefits of alternative courses of action consistent with conserving the species or its critical habitat, and that the agency action is in the public interest.
- The agency action is of regional or national significance.

- The agency refrained from making any irreversible or irretrievable commitment of resources.

If the Endangered Species Committee decides to grant exemptions, it must establish mitigation and enhancement measures appropriate to minimize the adverse effects upon the northern spotted owl or its critical habitat. Mitigation options suggested in the evidentiary hearing are discussed in Chapter 6.

DEFINITION OF AGENCY ACTION

In order to adequately interpret and apply the criteria for exemption set out by the Endangered Species Act, the Committee should define the scope and character of the agency action for which exemption is sought. Specifically, the Endangered Species Committee should determine whether the Bureau of Land Management's application regarding the 44 FY 1991 timber sales constitutes a single agency action (i.e. a segment of the timber program) which has 44 discrete subparts, or constitutes 44 separate agency actions. This determination by the Endangered Species Committee will govern the manner in which the criteria are interpreted and applied.

As the Bureau of Land Management's application shows, 44 individual sales were submitted to the Fish and Wildlife Service for consultation under Section 7. The Fish and Wildlife Service issued a single document containing separate biological opinions addressing each of the sales. The record does not contain any unity of approach among the parties on this matter, although most analyses of data supplied by witnesses in the evidentiary hearing appeared to aggregate the 44 sales in some manner.

In this report, when the sales are referred to in the aggregate, the phrase "some or all" is used to avoid taking a particular position on this issue.

BUREAU OF LAND MANAGEMENT TIMBER PROGRAM

Most of the lands administered by the Bureau of Land Management in Western Oregon are managed under the Oregon and California (O&C) Act of 1937, which specified that lands

> *classified as timberlands, and power-site lands valuable for timber, shall be managed . . . for permanent forest production, and the timber thereon shall be sold, cut and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities . . ..* [FWS Exhibit 40]

This Act contains two key principles to assist in understanding the Bureau of Land Management's exemption requests: 1) the Act emphasized timber management by specifying that lands classified as timberlands should be managed for permanent forest production; and 2) the Act provided that 50 percent of the revenues generated by the O&C lands be distributed to the counties in which at least some of those lands are located. Appendix 2 provides a list of statutes and executive orders (as amended) constituted as major legal guidance for planning and management of lands administered by the Bureau of Land Management in Western Oregon, and which were addressed and considered in preparation of the Bureau's Timber Management Plans.

NORTHERN SPOTTED OWL

The northern spotted owl of British Columbia, Washington, Oregon and Northern California lives primarily in dense, mature and old-growth forests, commonly dominated by Douglas fir, although a number of other forest types and some younger age stands are also used. Mature and old-growth forests contain the structural characteristics and vegetation type that best provide spotted owls with food, cover, nesting sites, and protection from weather and predation.

> *The spotted owl occupies a number of physiographic provinces in western Washington, Oregon, and northern California. It is a territorial species that generally uses large expanses (median of 2,000-14,000 acres per pair) of older forests (150-200 year old trees) to successfully survive and reproduce. Habitat characteristics (primary constituent elements) suitable for owl pair survival and reproduction must provide 4 components: 1) nesting, 2) roosting, 3) foraging, and 4) dispersal. To maintain a population sufficiently large to have genetic viability requires large expanses of relatively contiguous habitat. Young animals have a relatively high mortality rate, and are more vulnerable to predation when crossing clearcuts.* [NFRC Exhibit 13]

Although at the time the record was compiled a census of the total population of northern spotted owls was not available, efforts to inventory and monitor owls have located about 2,000 pairs between 1985 and 1990. There are estimated to be about 6,000 northern spotted owls in existence. Bureau of Land Management forests account for approximately 12 percent of the northern spotted owl habitat. [FWS Exhibit 15]

REPORT OF THE SECRETARY OF THE INTERIOR

The Endangered Species Act requires the Secretary of the Interior to submit a report to the Endangered Species Committee addressing:

1. The availability of reasonable and prudent alternatives to the agency action (Chapter 1).

In order to exempt a sale the Endangered Species Committee must determine that there are no "reasonable and prudent alternatives" to the sale.

Five alternatives are discussed in this chapter. One alternative, suggested in the Section 7 consultation process by the Fish and Wildlife Service, would be to defer the sales until the Bureau of Land Management develops a conservation strategy for protection of the owl and the sales are determined to be consistent with the strategy.

The Bureau of Land Management has taken the position, in its application and in the hearing, that there are no reasonable and prudent alternatives to the 44 sales. [BLM Exhibit 158, page 6] This position was treated in Chapter 1 as one of the five alternatives suggested.

Three other alternatives were suggested in the hearing: substitute FY 1992 sales that have received a draft no-jeopardy opinion for some or all of the FY 1991 sales; forgo some or all of the 44 sales in order to make the Bureau of Land Management's allowable sale quantity consistent with the Interagency Scientific Committee strategy; and, harvest the 44 tracts using techniques other than clearcutting.

2&3. The nature and extent of the benefits of the agency action (Chapter 2), and alternative courses of action consistent with conserving the species or its critical habitat (Chapter 3).

In order to grant an exemption, the Committee must determine that the benefits of the proposed action clearly outweigh the benefits of alternative courses of action that are consistent with conserving the species or its critical habitat. Chapters 2 and 3 focus on the economic benefits and costs of the proposed actions (the 44 sales) and the benefits of alternative courses of action. Accordingly, in these chapters the 44 sales are analyzed collectively as a group. Benefits and costs associated with individual sales may be estimated by proportioning the benefits and costs across all of the sales based on the proportion of the total board feet that each individual sale represents (see Table 4.10).

The primary regional benefits of the 44 sales are stumpage and employment benefits. The analysis of regional effects in Chapter 2 is based on a definition of region as the Westside of Oregon. Chapter 4 and Table 4.10, however, provide calculations of regional benefits at the sale level for stumpage and employment, and the county and other regional subdivisions smaller than Western Oregon. Regional stumpage benefits of the 44 sales could range from $0 million to $64 million. The estimated range for employment benefits is $11.9 million to $18.8 million. Alternative courses of action might replace up to $5 million of the regional stumpage benefits, and up to $4.1 million in regional employment benefits could be replaced through a combination of imports, log diversions and Westside-timber response (see Chapter 2, Tables 2.3 and 2.5 and Chapter 3, Table 3.1).

The primary national market-related economic benefits of the proposed actions are timber stumpage benefits and employment benefits. Timber stumpage values for the proposed actions are estimated to range from $58 million to $64 million. At the national level, these 44 sales represent up to approximately $38 million in revenues to the Federal treasury. National employment benefits are likely to be less than regional employment benefits due to the attraction of resources into the region from outside the region. However, it is possible that national effects could be larger than regional effects due to multiplier effects that extend beyond the borders of a region. In order for this to occur, the additional national economic activity would have to use previously unemployed resources.

The alternative action of not granting the proposed exemptions and allowing the national market to respond with substitutes is associated with national stumpage values of about $10 million and national employment benefits ranging of up to $10.7 million, depending on the magnitude of the timber response. Thus, while alternative actions involve stumpage losses, it is likely that on a national basis most of the employment effects associated with not granting the proposed actions will be offset by gains outside the Westside Oregon region. Recreation costs, decreased existence values and other environmental costs associated with the proposed actions are unpriced.

4. A summary of the evidence concerning whether or not the agency action is of national or regional significance (Chapter 4).

To grant exemptions, the Committee must determine that some or all of the sales are of regional or national significance. The geographic definition of the relevant economic region plays a significant role in defining the severity of the regional effects from the 44 sales. This chapter discusses the issue of what constitutes a region as presented in the evidentiary hearing, and provides information on the implications of the proposed actions as they might relate to several different definitions of region.

Two primary effects of the 44 sales are discussed in the chapter. One is the extent to which the 18 O&C counties might be affected if the 44 tracts are not sold and harvested. The second is the effect of the 44 sales on employment in the counties in which the sales would be held. A table is also presented which summarizes certain characteristics and effects of each of the 44 sales individually.

If all of the 44 sales were harvested in a single year, the 18 counties which are the primary recipients of the non-Federal portion of revenue sharing, would share about $31 million and the Federal treasury would receive about $38 million. Total receipts attributed to the 44 sales would comprise about one percent of the 1988-89 budgets for three counties, between one and five percent for seven counties, and greater than five percent for seven counties with the upper bound being 12.2 percent, assuming that all of the revenue loss occurs in a single year. If the 44 sales were harvested over a three year period, it is estimated that the counties would share approximately $3 million the first year, $19 million the second and $9 million the third.

The estimated timber jobs (man-years) associated with the 44 sales represent approximately 10 percent of the 1990 non-agricultural wage and salary timber employment for Coos and Douglas Counties, and 7.5 percent for Lincoln County, assuming that all of the employment effects occur in a single year. The effects for any single year would be less if the sales were harvested over a three year period. These employment figures are gross in the sense that they do not account for reemployment effects if the tracts are not harvested. Reemployment effects are taken into account in Chapters 2 and 3.

5. **A summary of the evidence concerning whether or not the agency action is in the public interest (Chapter 5).**

As part of its decision process, the Endangered Species Committee must determine whether some or all of the 44 sales are in the public interest. The Bureau of Land Management application for exemptions asserts that the sales are in the public interest because the timber industry and counties made plans based on the sales level provided for in the Bureau's decadal plans, and because of potential effects on local employment and county revenues. [BLM Exhibit 158, page 18] The Endangered Species Act provides no guidance on what constitutes public interest. This chapter contains a summary of the arguments provided by counsels for the parties in their closing briefs on the subject of public interest, although virtually no witness testified directly to the issue.

6. **Appropriate reasonable mitigation and enhancement measures which should be considered by the Committee (Chapter 6).**

This chapter addresses possible mitigation measures that could be adopted should exemptions be granted. The chapter contains a summary of the general mitigation measures suggested by the Bureau of Land Management in its application and measures suggested by witnesses in the hearing. No witness suggested site-specific options for mitigating for northern spotted owl habitat that would be adversely affected at particular sales if exemptions were granted.

7. **Whether the Federal agency concerned and the exemption applicant refrained from making any irreversible or irretrievable commitment of resources (Chapter 7).**

   This chapter addresses the extent to which the Bureau of Land Management refrained from making any irreversible or irretrievable commitment of resources. During the hearing, the Bureau of Land Management made no indication that it had taken any irreversible or irretrievable actions, and no witnesses claimed that the Bureau of Land Management had done so.

SUMMARY OF INDIVIDUAL SALES

A large quantity of information on the individual sales and the Bureau of Land Management districts within which the sales occur was provided in the hearing by the Bureau of Land Management, through its witnesses and particularly through exhibits containing Timber Sale Administrative Records, Bureau of Land Management Timber Management Plans, 1988-1990 analyses of those plans, maps and other information. [BLM Exhibits 1-156 and 208-212] This report makes an effort to bring the volumes of evidence together in Table 4.10 to assist the Endangered Species Committee in assessing the attributes of, and effects associated with, each sale. Table 4.10 is reprinted from Chapter 4, where it is accompanied by a brief explanation of the sources of information, methods used for calculating data for each column, and nature of the information provided. Additional details about sources and methods of calculation may be found throughout Chapters 2, 3 and 4.

Table 4.10. Summary of Information Specific to Each Sale

Sale	County	Sale Acres	Age of Timber	Timber Volume (MMBF)	Price per MBF	Revenue to Federal Treasury	Revenue to Counties	Percent to Counties	Jobs	Contract Period (months)	Take	50-11-40 Violation	Root Rot
Last Yankee	Coos	19	150	1.511	$314	$450,053	$23,986	5.1%	16	12	No	Yes	No
King Smith	Coos	72	80-110	3.979	$240	$477,575	$477,575	50.0%	43	24	No	Yes	No
Brownson Headwater	Coos	104	100-200	6.463	$314	$1,466,374	$564,437	27.8%	70	24	Yes	Yes	No
Fall Apart	Coos	247	100-140	14.074	$305	$2,156,180	$2,132,631	49.7%	153	36	Yes	Yes	No
Elk 24	Coos	103	200+	6.26	$428	$1,339,323	$1,339,323	50.0%	68	24	Yes	Yes	No
Cross Out	Coos	35	140	1.995	$284	$534,389	$31,669	5.6%	22	18	No	Yes	No
Chicken Deluxe	Coos	82	100	4.928	$257	$935,502	$332,389	26.2%	54	36	No	Yes	Yes
Halfway Oxbow	Douglas	65	200+	4.544	$323	$733,186	$733,186	50.0%	50	36	No	Yes	No
Devore Mountain	Douglas	131	125-200+	6.011	$275	$826,570	$826,570	50.0%	66	24	No	Yes	No
Windy	Douglas	181	80-100	12.22	$352	$2,152,222	$2,152,222	50.0%	133	27	No	Yes	No
Bateman & Robin	Douglas	80	200+	5.419	$381	$1,031,354	$1,031,354	50.0%	59	36	No	Yes	No
North Sand Creek	Douglas	117	165-200+	5.165	$296	$765,331	$765,331	50.0%	56	24	Yes	No	No
Amberson Creek	Douglas	149	200+	6.065	$299	$907,368	$907,368	50.0%	66	36	Yes	Yes	No
Callahan 20 Cleanup	Douglas	55	100-200+	2.653	$228	$581,888	$24,245	4.0%	29	24	Yes	Yes	No
Green Cedar	Douglas	43	120	2.653	$249	$633,799	$26,408	4.0%	29	24	Yes	No	No
Barneys Peak	Douglas	67	82-200+	3.227	$292	$470,461	$470,461	50.0%	35	24	Yes	No	No
Four Gates	Douglas	170	150-200+	6.244	$279	$870,513	$870,513	50.0%	68	36	Yes	Yes	No
Camas Valley West	Douglas	217	80-200	8.671	$550	$2,382,649	$2,382,649	50.0%	95	36	Yes	Yes	No
Clabber Creek	Douglas	51	140-200+	2.57	$287	$369,437	$369,437	50.0%	28	36	No	Yes	No
Herb Cluster	Douglas	135	200+	8.161	$343	$1,399,558	$1,399,558	50.0%	89	36	No	Yes	No
Horse Heaven	Douglas	200	80+	9.571	$287	$1,375,481	$1,375,481	50.0%	104	36	No	Yes	No
Renhaven	Douglas	82	180-200+	4.492	$339	$762,255	$762,255	50.0%	49	36	Yes	No	No

Table 4.10. Summary of Information Specific to Each Sale

Sale	County	Sale Acres	Age of Timber	Timber Volume (MMBF)	Price per MBF	Revenue to Federal Treasury	Revenue to Counties	Percent to Counties	Jobs	Contract Period (months)	Take	50-11-40 Violation	Root Rot
Salty Dog	Douglas	116	80-200	1.672	$251	$209,729	$209,729	50.0%	18	24	No	Yes	No
Prego	Douglas	211	80-200	7.054	$237	$1,483,296	$191,032	11.4%	77	36	No	Yes	No
Independence	Douglas	75	160-200+	3.06	$282	$574,346	$288,281	33.4%	33	24	Yes	Yes	No
Luts Breakout	Douglas	51	80	1.68	$225	$189,060	$189,060	50.0%	18	24	No	Yes	No
Moore Coon	Douglas	83	200+	5.379	$380	$1,023,187	$1,023,187	50.0%	59	24	No	Yes	No
Pita Ridge	Douglas	86	200	4.486	$350	$785,998	$785,998	50.0%	49	36	No	Yes	No
Northside	Douglas	108	200+	9.4	$396	$1,860,627	$1,860,627	50.0%	102	24	No	Yes	No
Pea Gravel Clay	Douglas	119	80-200	4.402	$304	$668,179	$668,179	50.0%	48	36	No	Yes	No
Fox Hollow	Lane	56	130-200+	1.887	$255	$240,951	$240,951	50.0%	21	24	No	Yes	No
Alma Ranch	Lane	30	180+	1.477	$324	$239,377	$239,377	50.0%	16	12	Yes	Yes	No
33 and 1	Lane	165	90-180+	7.308	$276	$1,007,762	$1,007,762	50.0%	80	30	Yes	Yes	No
Chopped Hamm	Lane	144	120-200+	5.831	$235	$684,911	$684,911	50.0%	64	36	Yes	Yes	No
Lake Creek	Lane	33	50-180+	1.614	$316	$255,323	$255,323	50.0%	18	18	Yes	Yes	No
Young Leo	Lane	115	170-180+	5.269	$307	$807,765	$807,765	50.0%	57	24	Yes	Yes	No
Table Creek	Lane	37	100	1.402	$227	$159,147	$159,147	50.0%	15	18	No	Yes	No
Stennets Fawn Farm	Lane	89	80-200+	4.54	$312	$707,542	$707,542	50.0%	49	24	No	Yes	No
Eddy Whittaker	Lane	39	180+	1.904	$250	$237,962	$237,962	50.0%	21	18	Yes	Yes	No
Weiss Road	Lane	134	100-200+	5.869	$268	$785,916	$785,916	50.0%	64	30	Yes	Yes	No
Back in the Saddle	Lincoln	78	100-180	6.047	$278	$1,616,141	$67,339	4.0%	66	36	No	Yes	No
Kitchen Door	Polk	51	80-200+	4.012	$340	$682,398	$682,398	50.0%	44	24	Yes	No	No
Tigger Too	Yamhill	58	100	4.103	$358	$734,237	$734,237	50.0%	45	36	No	Yes	Yes
Rootballs	Yamhill	165	50	3.38	$226	$382,205	$382,205	50.0%	37	24	No	Yes	Yes

GLOSSARY OF TERMS USED IN THIS REPORT

This glossary identifies words and descriptive phrases used throughout this report that may not be familiar to members of the Endangered Species Committee.

Allowable Sale Quantity (ASQ): The gross amount of timber volume, including salvage, that may be sold annually or periodically from a specified area over a stated period in accordance with the management plan.

Available Forest Land: That portion of the forested acres for which timber production is planned and included within the acres contributing to the allowable sale quantity (ASQ). This includes both lands allocated primarily to timber production and lands on which timber production is a secondary objective.

Board Foot (BF): A unit of solid wood, one foot square and one inch thick. "MBF" refers to one thousand board feet and "MMBF" refers to one million board feet.

Canopy Closure: The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Clearcutting: A harvesting method in which an entire stand is harvested in single entry, with the exception of wildlife trees or snags.

Commercial Thinning: Partial cuttings in merchantable timber stands to increase merchantable yield by redistributing growth and salvaging existing and expected mortality.

Community Stability: The capacity of a community (incorporated town or county) to absorb and cope with change without major hardship to institutions or groups within the community.

Coos Bay Wagon Road Lands: Public lands granted to the Southern Oregon Company and subsequently reconveyed to the United States.

Critical Habitat: Specific areas within the geographical area occupied by a species at the time of listing on which are found those physical or biological features essential to conservation of the species and which may require special management considerations or protection; and specific areas outside the geographical area occupied by the species at the time of listing upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species. [Endangered Species Act, Section 3(5)(A)(i-ii]

Dispersal Habitat: Habitat that supports the life needs of an individual bird or animal during dispersal. Generally satisfies needs for foraging, roosting, and protection from predators.

"50-11-40" Rule: A guideline developed by the Interagency Scientific Committee to provide habitat conditions adequate for movement of juvenile and adult owls across the landscape. It refers to the condition in which at least 50 percent of the land be maintained with an average tree diameter at breast height of at least 11 inches and 40 percent canopy closure.

Incidental Take: The taking of a threatened or endangered species that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (See "take").

Jeopardy or no-jeopardy opinion: A determination by the Fish and Wildlife Service on whether or not a proposed agency action is likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of its critical habitat. A draft jeopardy or no-jeopardy opinion is provided for review to the action agency by the Fish and Wildlife Service prior to issuance of the final opinion.

Long-Term: For Bureau of Land Management planning, the period starting 10 years following implementation of the Bureau of Land Management's decadal Resource Management Plan. For most analyses of the northern spotted owl, long-term effects are defined as those existing 100 years after implementation.

Long-term Sustained Yield: Estimated timber harvest that can be maintained indefinitely once all stands have been converted to a managed state under a specific management intensity.

Multiple Use: Management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people.

Oregon & California (O&C) Lands: Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Pre-commercial Thinning: Removing pre-merchantable conifers to control density and species composition and to concentrate growth on a desired number of potential crop trees.

Public Lands: Any land or interest in land owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management. May include public domain, O&C, or acquired lands in any combination.

Public Domain Lands: Original holdings of the United States never granted or conveyed to other jurisdictions.

Quarter Township: Nine square miles, three miles on a side.

Resource Management Plan (RMP): A land use plan prepared by the Bureau of Land Management under current regulations in accordance with the Federal Land Policy and Management Act.

"Safety Net": For FY 1991 Congress guaranteed O&C counties 90 percent of the average revenue received during 1988 through 1990, and for FY 1992, 90 percent of the average for 1986 through 1991.

Silviculture: The act of producing and tending a forest.

Slash: The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging has been completed.

Stumpage Value: The value of the standing timber, as represented by the price offered to the Bureau of Land Management by bidders. Bidders take into account harvesting and transportation costs in preparing their bids.

Sustained Yield: The yield that a forest can produce continually at a given intensity of management.

Take: Under the Endangered Species Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. [Endangered Species Act, Section 3(18)]

Timber Management Plan: An activity plan that specifically addresses procedures related to the offering and sale of timber volume consistent with the approved allowable sale quantity.

INTRODUCTION TO THE REPORT

BUREAU OF LAND MANAGEMENT APPLICATION

On September 11, 1991, the Bureau of Land Management filed an application with the Secretary of the Interior, as Chairman of the Endangered Species Committee, seeking exemption from Section 7 of the Endangered Species Act that would permit the Bureau to hold timber sales on 44 tracts remaining in the Bureau's 1991 timber sales program in Oregon.

As described in its application, the Bureau of Land Management had submitted for Section 7 consultation to the Fish and Wildlife Service 175 timber sales under its FY 1991 program. As a result of the consultation, on June 17, 1991 the Fish and Wildlife Service issued its final biological opinion that 52 of the sales are likely to jeopardize the continued existence of the northern spotted owl. [BLM Exhibit 158, Appendix G, Tables 1 and 2]

Following the jeopardy opinion, the Bureau of Land Management modified eight of the sales to alleviate the jeopardy situation. [BLM Exhibit 158] The remaining 44 sales are the subject of the exemption application. The counties in which these sales occur are shown in Figure Intro.1, a map of the 18 Western Oregon counties. These 18 counties (O&C counties) share in the revenues from timber harvested on the sales (discussed in greater detail in Chapters 1 and 4).

The Bureau of Land Management argues that not making the 44 sales would adversely affect local economies. In its application, the Bureau proposes several mitigation measures that it would apply to the timber sales if exemptions are granted (Chapter 6).

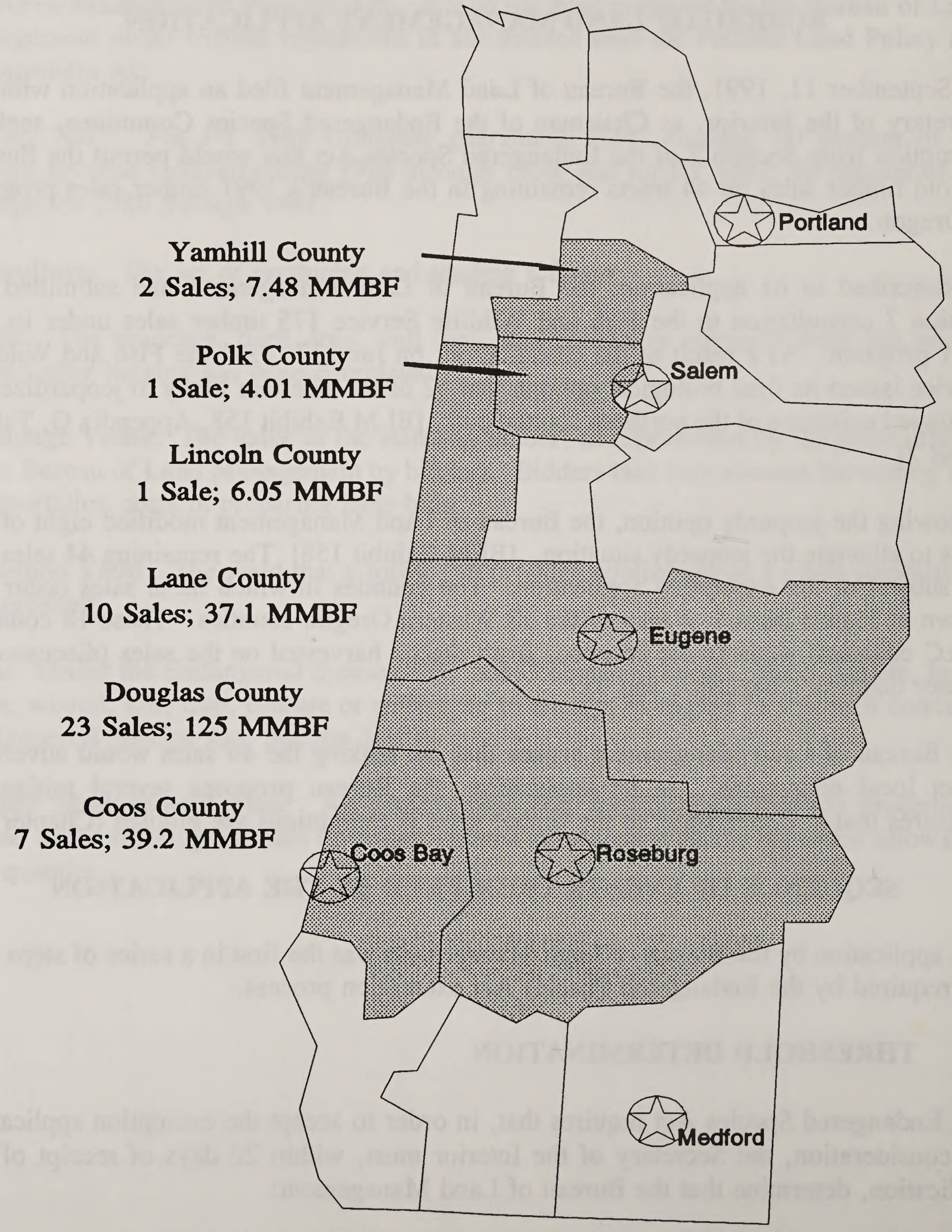
SEQUENCE OF EVENTS TRIGGERED BY THE APPLICATION

The application by the Bureau of Land Management was the first in a series of steps that are required by the Endangered Species Act exemption process.

1. THRESHOLD DETERMINATION

The Endangered Species Act requires that, in order to accept the exemption application for consideration, the Secretary of the Interior must, within 20 days of receipt of the application, determine that the Bureau of Land Management:

Oregon's O&C Counties, Showing the Counties in Which the 44 "Exemption" Sales Would Occur



Yamhill County
2 Sales; 7.48 MMBF

Polk County
1 Sale; 4.01 MMBF

Lincoln County
1 Sale; 6.05 MMBF

Lane County
10 Sales; 37.1 MMBF

Douglas County
23 Sales; 125 MMBF

Coos County
7 Sales; 39.2 MMBF

Figure Intro.1

- Carried out the Section 7 consultation with the Fish and Wildlife Service in good faith and made a reasonable and responsible effort to develop and fairly consider modifications or reasonable and prudent alternatives to the jeopardy sales which would not jeopardize the owl;
- Conducted the required biological assessments; and
- Refrained from making any irreversible or irretrievable commitment of resources that would foreclose any reasonable and prudent alternatives.

On October 1, 1991, the Secretary of the Interior determined that the Bureau of Land Management exemption application met the threshold criteria. He then convened an informational meeting of the Endangered Species Committee on November 19, 1991.

2. EVIDENTIARY HEARING

As required by the Endangered Species Act, following a determination that all threshold criteria are met, the Secretary of the Interior must hold a formal hearing on the application for exemptions. The Secretary of the Interior designated Harvey C. Sweitzer, an administrative law judge, to conduct the hearing.

Regulations require that the applicant has the " . . . burden of going forward with the evidence concerning the criteria for exemption." [50 CFR 452.05(e)]

Two pre-hearing conferences were held in Portland, Oregon, to establish procedures for the hearing, to clarify matters of fact and of law that might bear on the course of the hearings, and to clarify what information would be expected from the Bureau of Land Management and the Fish and Wildlife Service and from any intervenors. The first was held on December 3-4, 1991; the second was held on January 7, 1992, immediately preceding the hearing. The hearing was held January 8-30, 1992, in Portland, Oregon.

Under Endangered Species Act regulations, parties to the hearings " . . . shall consist of the exemption applicant, the Federal agency responsible for the agency action in question, the [Fish and Wildlife] Service, and intervenors whose motions to intervene have been granted." [50 CFR 452.06(a)] For these hearings, the **Bureau of Land Management, represented by Roger W. Nesbit** was both the applicant and Federal agency. The **Fish and Wildlife Service, represented by Patrick A. Parenteau**, was the other primary party.

In the evidentiary hearing process, the Bureau of Land Management and the Fish and Wildlife Service were often characterized as being on opposing sides of the issue, one as "pro-exemption" and the other as "anti-exemption." The Committee decision, however, should not be viewed as determining that one party is somehow "right" and the other somehow "wrong," but whether certain statutory exemption criteria are met in this specific instance.

Each Bureau has its own, individual, statutory responsibilities relating to this issue. The Bureau of Land Management has a legal mandate to provide timber supplies on a sustainable basis, subject to certain constraints. The Fish and Wildlife Service has a statutory mandate to advise the Federal action agency, in this case the Bureau of Land Management, as to the possible effects that its timber sales might have on species listed as threatened or endangered. When, as in this case, the Fish and Wildlife Service finds that an action would jeopardize a listed species, it has no alternative but to issue a jeopardy opinion. The Federal action agency, in this case, the Bureau of Land Management has authority under the Endangered Species Act to apply for exemption from the Act if it believes that its actions meet the statutory criteria.

In the cover letter to the Bureau of Land Management application for exemptions, Director Cy Jamison stated that

> *With the situation approaching the crisis stage in providing a reasonable timber supply to the communities in Western Oregon and with the 90 day deadline provided for in the Endangered Species Act approaching, the Bureau of Land Management formally requests you to convene the Exemption Committee as provided for in the Endangered Species Act.* [BLM Exhibit 158]

Is his affidavit, Fish and Wildlife Service Director John Turner testified that

> *. . . it is important to note that the Service did not "decide" to become involved in this proceeding. The exemption regulations . . . automatically make the Service a party to any exemption proceedings.*
>
> *The FWS is participating in this proceeding as required by the exemption regulations and to ensure that the Secretary and Endangered Species Committee have a full and complete administrative record upon which to make their determinations.* [Affidavit of John Turner, pages 2-3]

The regulations provide that additional parties may be accepted as intervenors. Judge Sweitzer granted intervenor status to:

Northwest Forest Resource Council, Western Council of Industrial Workers, Northwest Forestry Association, Western Forest Industries Association, C & D Lumber, Swanson Brothers Lumber Co., Rogge Forest Products, Inc., and Pope & Talbot, Inc., represented by **Mark C. Rutzick** and **Jeffrey T. Lawrence.**

Portland Audubon Society, Lane County Audubon Society, Pilchuck Audubon Society, National Audubon Society, Oregon Natural Resources Council, Headwaters, Sierra Club, The Wilderness Society, Defenders of Wildlife, and National Wildlife Federation, represented by **Victor M. Sher.**

Association of O & C Counties, Coos County, Douglas County, Lane County, Polk County, Yamhill County, represented by **Kevin Q. Davis.**

Oregon Lands Coalition, represented by **William Perry Pendley, Todd W. Welch,** and **Paul M. Seby.**

State of Oregon (limited intervenor), represented by **Melinda L. Bruce.**

Initially, the judge granted limited intervenor status to the **Environmental Protection Agency**, but the Agency withdrew from intervenor status at the beginning of the hearing.

3. PUBLIC HEARING

On February 12 and 13, 1992, the Committee held a public hearing in Portland, Oregon, to give the public an opportunity to comment on the application for exemption. The Federal Register Notice announcing the public hearing noted "the Chairman of the Endangered Species Committee has decided that for purposes of receiving background information, it is appropriate under the authority of 16 U.S.C. & 1536 (e)(7)(A) and 50 C.F.R. & 453.04, to provide the public an opportunity to comment on the Bureau of Land Management's exemption application."

At the Chairman's request, Counselor to the Secretary of the Interior chaired the public hearing. The President's designee from the State of Oregon as well as designees for each of the following Endangered Species Committee members were in attendance: Department of Agriculture, Department of the Army, Environmental Protection Agency, and the National Oceanic and Atmospheric Administration. All interested persons were invited to attend and offer their comments.

A verbatim transcript was compiled reflecting oral comments of 97 witnesses who appeared before the Endangered Species Committee. Many witnesses also submitted written comments. Letters, petitions, mailgrams or testimonies were submitted on behalf of approximately 1,800 persons who were unable to attend the hearing. All written material is available for public inspection and for the Endangered Species Committee members.

4. REPORT OF THE SECRETARY OF THE INTERIOR

The Endangered Species Act [Section 7(g)(5)(A-D)] and the Endangered Species Exemption Process regulations [(50 CFR 452.04(a)(1-7)] require the Secretary of the Interior to submit to the Endangered Species Committee a report discussing:

a. The availability of reasonable and prudent alternatives to the agency action; (see Chapter 1)

b. The nature and extent of the benefits of the agency action; (see Chapter 2)

c. Alternative courses of action consistent with conserving the species or its critical habitat; (see Chapter 3)

d. A summary of the evidence concerning whether or not the agency action is of national or regional significance; (see Chapter 4)

e. A summary of the evidence concerning whether or not the agency action is in the public interest; (see Chapter 5)

f. Appropriate reasonable mitigation and enhancement measures which should be considered by the Committee; (see Chapter 6) and,

g. Whether the Federal agency concerned and the exemption applicant refrained from making any irreversible or irretrievable commitment of resources. (see Chapter 7)

This document, the Secretary's report to the Endangered Species Committee, and the evidentiary hearing record provide the two primary sources of information upon which the Endangered Species Committee must render its decisions with regard to exemptions. The report includes all of the seven required elements, each of which is discussed in a separate chapter, as noted above.

5. DECISIONS OF THE ENDANGERED SPECIES COMMITTEE

The Endangered Species Act [Section 7(h)(1)] requires that the Endangered Species Committee shall grant one or more exemptions if, by a vote of not less than five of its members voting in person it determines on the record, based on the report of the Secretary, the record of the evidentiary hearing, and on such other testimony or evidence as it may receive, that:

a. There are no reasonable and prudent alternatives to some or all of the 44 sales.

"Reasonable and prudent alternatives" refer to alternative actions that can be implemented in a manner consistent with the intended purpose of the 44 sales, that can be implemented consistent with the scope of the Bureau of Land Management's legal authority and jurisdiction, that are economically and technologically feasible, and that the Director of the Fish and Wildlife Service believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat. [50 CFR 402.02]

b. The benefits of holding some or all of the 44 sales clearly outweigh the benefits of alternative courses of action consistent with conserving the species or its critical habitat, and that holding some or all of the 44 sales is in the public interest.

Unlike reasonable and prudent alternatives, alternative courses of action need not be limited to the jurisdiction of the Bureau of Land Management. Alternative courses of action can include no action and alternatives extending beyond original project objectives and Bureau of Land Management jurisdiction. [50 CFR 450.01]

c. Holding some or all of the 44 sales is of regional or national significance.

Assessment of the regional or national significance of the proposed actions may include the direct, indirect, and induced effects of the proposed actions. Direct effects are those that have a direct impact on resources employed in timber harvesting and processing. Indirect effects are those that affect businesses and individuals that service and supply timber harvesting and processing firms. Induced effects are those that occur broadly throughout the economy due to changed spending levels stemming from altered personal and business incomes.

d. The Bureau of Land Management refrained from making any irreversible or irretrievable commitment of resources to some or all of the 44 sales.

Irreversible or irretrievable actions are defined in regulations as any commitment of resources which has the effect of foreclosing the formulation

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> or implementation of any reasonable or prudent alternatives which would not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of its critical habitat. [50 CFR 450.01]

Mitigation Requirements

In addition, if the Endangered Species Committee decides to grant exemptions, it must also establish ". . . such reasonable mitigation and enhancement measures, including but not limited to, live propagation, transplantation, and habitat acquisition and improvement, as are necessary and appropriate to minimize the adverse effects . . . " of some or all of the 44 sales upon the northern spotted owl or its critical habitat. [Endangered Species Act, Section 7(h)(B)]

Environmental Impact Statement Requirements

Section 7(k) of the Endangered Species Act provides that the Endangered Species Committee need not prepare an environmental impact statement for exemption decisions

> . . . *Provided, that an environmental impact statement which discusses the impacts upon endangered species or threatened species or their critical habitats shall have been previously prepared with respect to any agency action exempted by such order.*

The Bureau of Land Management is currently involved in litigation involving the adequacy of its environmental impact statement. Testimony was placed in the evidentiary hearing record on this topic.

The Chairman of the Endangered Species Committee has asked the Committee counsel to provide an opinion on how to interpret and implement Section 7(k). The opinion is being forwarded simultaneously with the report to provide guidance to the Committee. Consistent with the conclusions in the legal opinion, this report makes use of the evidence provided on Section 7(k) where the data may help the Endangered Species Committee evaluate the criteria on which exemption decisions must be based.

CHAPTER 1

Availability of Reasonable and Prudent Alternatives to the 44 Sales

> or implementation of any reasonable or prudent alternatives which would not jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of its critical habitat. (50 CFR [illegible])

Mitigation Requirements

In addition, if the Endangered Species Committee decides to grant exemptions, it must also establish [illegible] reasonable mitigation and enhancement measures, including but not limited to, live propagation, transplantation, and habitat acquisition and improvement, as are necessary and appropriate to minimize the adverse effects [illegible] of some or all of the 44 timber sales on the threatened species and/or its critical habitat. (Endangered Species Act, Section 7(h)(1)(B))

Environmental Impact Statement Requirements

Section 7(k) of the Endangered Species Act provides that the Endangered Species Committee shall not prepare an environmental impact statement for exemption decisions:

> *Provided, that an environmental impact statement which discusses the impacts upon endangered species or threatened species or their critical habitats shall have been previously prepared with respect to any agency action exempted by such order.*

The Bureau of Land Management is currently involved in litigation involving the adequacy of its environmental impact statement. Testimony was placed in the evidentiary hearing record on this issue.

The Chairman of the Endangered Species Committee has asked the Committee's counsel to provide an opinion on how to interpret and implement Section 7(k). The opinion is being forwarded simultaneously with this report to provide guidance to the Committee. Consistent with the instructions in the legal opinion, this report summarizes all of the evidence provided on [illegible]. This summary data may help the Endangered Species Committee evaluate the criteria on which exemption decisions must be based.

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CHAPTER 1. AVAILABILITY OF REASONABLE AND PRUDENT ALTERNATIVES

INTRODUCTION

The Endangered Species Committee must, in order to grant exemptions, determine that there are no "reasonable and prudent alternatives" to some or all of the 44 sales. This chapter provides background on the Bureau of Land Management timber program in Western Oregon and on the biology of the northern spotted owl. This background is intended to help the Endangered Species Committee to assess whether proposed alternatives are consistent with the Bureau of Land Management's authority and jurisdiction, and likely to avoid jeopardy to the owl.

Five alternatives are discussed in this chapter. These are summarized in Table 1.1. One is the alternative suggested by the Fish and Wildlife Service in its biological opinion--defer the sales until the Bureau of Land Management develops a long-term conservation strategy for protection of the owl and these sales are determined to be consistent with the strategy. One represents the position of the Bureau of Land Management--there are no reasonable and prudent alternatives.

Three other alternatives were suggested in the hearing: substitute for some or all of the FY 1991 sales some of the FY 1992 sales that, after the Bureau of Land Management application for exemptions was filed, received a draft no-jeopardy opinion; forgo some or all of the 44 sales in order to make the Bureau of Land Management's allowable sale quantity consistent with the Interagency Scientific Committee strategy which sets aside large acreages of old-growth forest for conservation of the owl; and harvest some or all of the 44 tracts using techniques other than clearcutting.

BACKGROUND

As defined in the Section 7 consultation regulations, "reasonable and prudent alternatives" refer to

> *. . . alternative actions identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that the Director [of the Fish and Wildlife Service] believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.* [50 CFR 402.02]

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The charge to the Endangered Species Committee is to determine whether there are any reasonable and prudent alternatives, and the Committee need not be restricted to only those alternatives identified during formal consultation.

Table 1.1

Summary of Potential Reasonable and Prudent Alternatives

Potential Alternative:	Exemption Proponents:	Exemption Opponents:
Delay sale of the 44 tracts until an owl conservation plan is implemented.	The sales are needed now for community stability and deferral does not guarantee a subsequent no-jeopardy opinion.	With low demand, the timber will not be needed in the near future.
Existence of reasonable and prudent alternatives.	There are none. Sales already have been brought in from FY 1992 and no more can be; alternative harvesting methods are not appropriate.	There are several possible alternatives.
Substitute FY 1992 sales for FY 1991 sales.	Not possible due to legal constraints, lags in planning process, age of trees, etc. Limited future sources of potential sales.	There are enough FY 1992 sales with no-jeopardy opinion for the owl to replace all of the 44 sales.
Reduce FY 1991 program to revised sustained yield level per new owl restrictions.	BLM sales are below its cumulative allowable annual sale quantity for the 1980's decadal plan.	The 44 sales place BLM over what its revised sustained yield level should be.
Use alternative harvesting techniques.	Clearcutting is the preferred harvesting method for a variety of reasons.	Thinning or selective harvest would provide habitat and continued employment.

Because an assessment of the availability of reasonable and prudent alternatives involves both the authority and jurisdiction of the Bureau of Land Management and the likelihood of jeopardizing the northern spotted owl, an introductory discussion of both issues is provided below.

1. BUREAU OF LAND MANAGEMENT TIMBER PROGRAM

Most of the Oregon timberlands administered by the Bureau of Land Management are managed under the Oregon and California Act of 1937, which, along with subsequent statutes such as the Federal Land Management and Policy Act, the National Environmental Policy Act and the Endangered Species Act, provided the framework for revested Oregon and California Railroad grant lands and reconveyed Coos Bay Wagon Road grant lands in the State of Oregon. Appendix 2 provides a list of authorities under which the Bureau of Land Management manages lands in Western Oregon.

The Oregon and California Act of 1937 established two important operating principles that are key to understanding the Bureau of Land Management exemption request. First, the Act emphasized timber management by specifying that lands

> *classified as timberlands, and power-site lands valuable for timber, shall be managed . . . for permanent forest production, and the timber thereon shall be sold, cut and removed in conformity with the principal of sustained yield for the purpose of providing a permanent source of timber supply, protecting watersheds, regulating stream flow, and contributing to the economic stability of local communities and industries, and providing recreational facilities . . ..* [FWS Exhibit 40]

The Act further directs that the annual productive capacity for such lands be determined and declared. In subsequent practice, the Bureau of Land Management has determined the annual productive capacity in ten-year segments through its decadal planning process. For its 1983-1992 decadal plan, the Oregon State Office of the Bureau of Land Management determined that the average annual sale quantity in Oregon would be 1.176 billion board feet.

The Bureau of Land Management's District Management Framework Plans establish land use allocations and management direction for the next decade. The Bureau of Land Management has entered into the hearing record the four district plans that encompass the counties with the 44 sales, presenting information by acres, county, type of authority for managing the lands, program objectives, land use allocations, planned management actions and rationale for individual resource uses, socioeconomic values, and detailed descriptions of areas involved. [BLM Exhibits 53-56]

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Second, the Act provided that 50 percent of the revenues generated by the Oregon and California (O&C) lands be paid to the counties in which at least some of those lands are located. [FWS Exhibit 40] The portion of revenues designated for counties is distributed among the counties in proportion to the relative assessed valuation of their respective Oregon and California lands for the year 1915. This county distribution formula has not been changed since it was established in 1937.

Under the original grant, the railroad received every other section of land (one square mile). As a consequence, the O&C lands (about 2.1 million acres) now administered by the Bureau of Land Management are configured in a so-called "checkerboard." Thus, the Bureau lacks the management flexibility that would be associated with contiguous acreage.

2. NORTHERN SPOTTED OWL

Habitats selected by the northern spotted owl of British Columbia, Washington, Oregon and Northern California

> . . . *typically exhibit moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; a high incidence of large trees with large cavities, broken tops, and other indications of decadence; numerous large snags; heavy accumulations of logs and other woody debris on the forest floor; and considerable open space within and beneath the canopy. These attributes are usually found in old growth, but they are sometimes found in younger forests, especially those that contain remnant large trees or patches of large trees from earlier stands. In younger forests that support breeding owls, the nest and major roost sites are usually found where large trees from the earlier, older stands remain.* [FWS Exhibit 15, pages 1 and 2]

Although a census of the total population of northern spotted owls is not available, efforts to inventory and monitor owls had, by 1990, located about 2,000 pairs. There were, in 1989, estimated to be about 6,000 northern spotted owls in existence. [FWS Exhibit 15, page 20]

Dr. E. Charles Meslow, a Fish and Wildlife Service witness, and a member of the Interagency Scientific Committee, provided a general guide to the habitat requirements of the northern spotted owl:

> *The northern spotted owl occupies a very specific habitat niche. Habitat for the bird must fulfill three basic life functions: nesting, foraging, and dispersal . . .. The best habitat for the owl is old-growth forest -- forest older than 200 years. Old-growth forest provides for all three basic life functions, including the most satisfactory nesting habitat. Forests between 200 years and 80 years of age*

> *provide habitat the owl uses successfully for foraging and dispersal but it is not as frequently used for nesting. Forests between 80 years and 40 years of age are adequate to provide for dispersal but are seldom adequate for foraging and are not adequate for nesting. Clear cut areas and forests younger than 40 years of age are not suitable habitat for the owl.* [Affidavit of E. Charles Meslow, page 4]

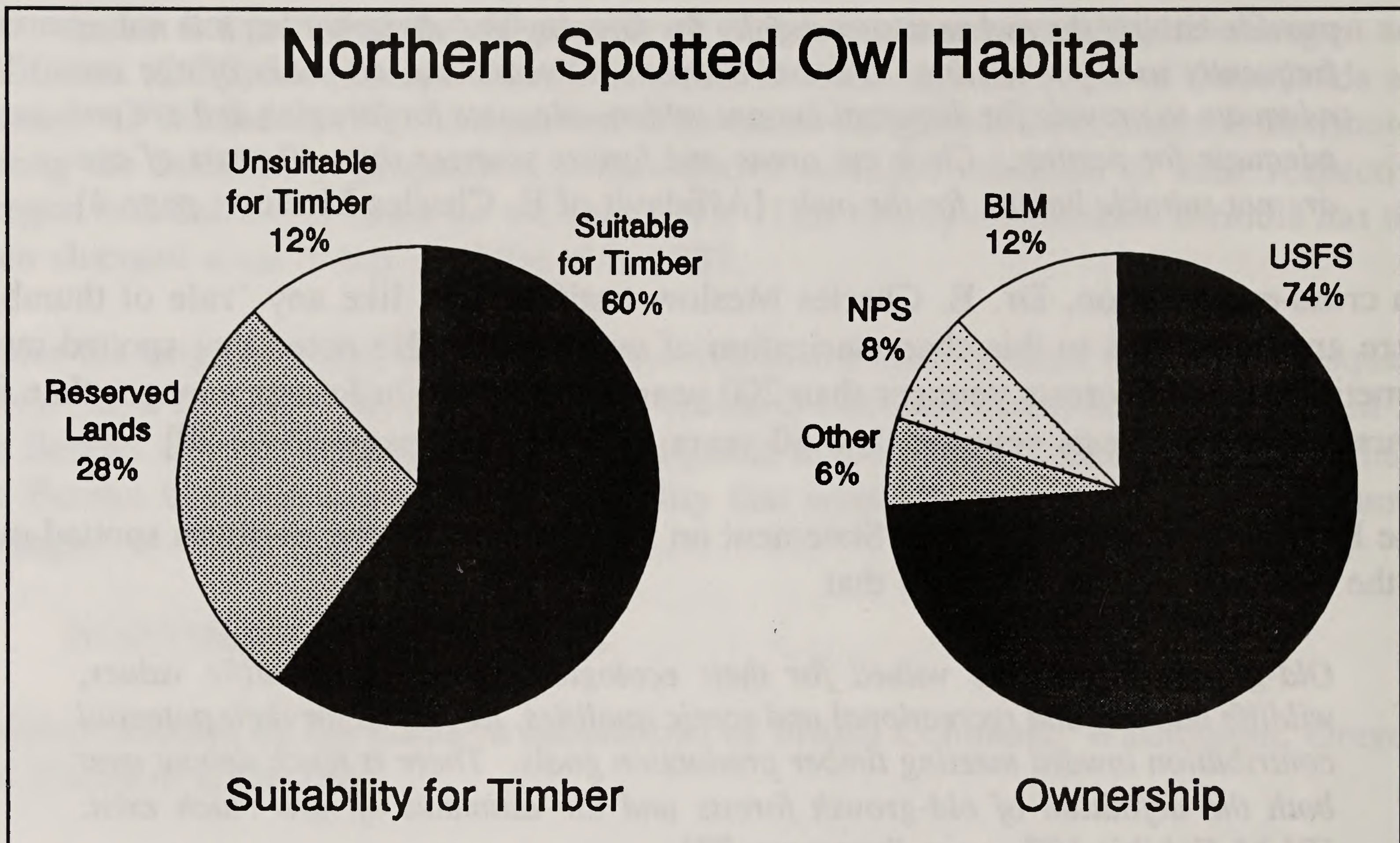
On cross-examination, Dr. E. Charles Meslow testified that, like any "rule of thumb," there are exceptions to this characterization of owl habitat. He noted that spotted owls sometimes nest in forests younger than 200 years, and forage in forests younger than 80 years and cross forests younger than 40 years. [Transcript, pages 2619-20]

The Final Environmental Impact Statement on management for the northern spotted owl in the National Forests indicates that

> *Old-growth forests are valued for their ecological diversity, scientific values, wildlife habitat, and recreational and scenic qualities, as well as for their potential contribution toward meeting timber production goals. There is much debate over both the definition of old-growth forests and the estimates of how much exist.* [BLM Exhibit 187, page Summary-23]
>
> *Species which need young forests and species which need old forests are affected by changes in the age, composition, and distribution of forest areas. Management to provide the diversity of the forest's structure and function is itself an issue. The spotted owl has been selected as an indicator for other species and many people see it as a surrogate for old-growth related species.* [BLM Exhibit 187, page 2-2]

Figure 1.1 shows the land ownership of spotted owl habitat; U.S. Forest Service lands account for 74 percent; Bureau of Land Management lands account for 12 percent of the nearly seven million acres of northern spotted owl habitat. Of the Federal acreage, old-growth forests preserved in Olympic National Park, Forest Service wilderness, and other reserved public lands provide nearly 1.9 million acres of permanent owl habitat, of which 158,000 acres occur on Bureau of Land Management lands in Oregon. Most northern spotted owl habitat is also suitable for timber. [FWS Exhibit 15, Table C1, page 65]

The Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl was established in October, 1989, through an interagency agreement among the Forest Service, Bureau of Land Management, Fish and Wildlife Service, and National Park Service. Shortly after it was chartered, its charter was incorporated into Section 318 of the Department of the Interior and Related Agencies Appropriations Act for FY 1990 [Public Law 101-121]. The Act required the Interagency Scientific Committee to develop a scientifically credible conservation strategy for the northern spotted owl. [FWS Exhibit 15, page 1] Its final report was published on April 2, 1990.



SOURCE: FWS Exhibit 15, Table C1, page 65 (for suitability for timber) and pages 14-15 (for land ownership).

Figure 1.1

The Interagency Scientific Committee proposed a two-part strategy for the conservation of the northern spotted owl. One objective is to take steps to ensure that adequate amounts and distribution of habitat are protected. [FWS Exhibit 15, p. 2] The Interagency Scientific Committee proposed to insure adequate habitat protection through the provision of large blocks of habitat, termed Habitat Conservation Areas or HCAs. Another objective is to space these Habitat Conservation Areas sufficiently close together to facilitate dispersal of owls between them. [FWS Exhibit 15, page 3]

The criterion for dispersal habitat proposed by the Interagency Scientific Committee was the so-called "50-11-40" rule. This means that, in each quarter township (nine square miles, three miles on a side), 50 percent of the forest matrix outside the Habitat Conservation Areas would be covered with stands of trees averaging 11 inches or more in diameter at breast height, with at least 40 percent of the canopy closed. [FWS Exhibit 15, page 4] Dr. E. Charles Meslow testified that, after the initial harvest, intensively managed forests would normally provide dispersal habitat after the trees reach 40 years of age. [Affidavit of E. Charles Meslow, page 10]

In January, 1992, the Fish and Wildlife Service determined critical habitat for 190 areas

> *. . . that include 6.88 million acres of Forest Service, Bureau of Land Management, and Military lands in the states of Washington, Oregon, and California.*
>
> *The 190 areas closely follow the recommendations of the Interagency Scientific Committee (ISC), but in total the final rule acreage determination is less than the acreage recommended by the ISC for inclusion in their Habitat Conservation Areas (HCAs), which included both state, park, and wilderness areas, and recommendations for management of the adjacent forest matrix.*
>
> . . . .
>
> *To reduce the overall impacts resulting from the August 1991 proposal to designate critical habitat, the Service excluded from the designation all State lands (about 580,000 acres) plus an additional 869,000 acres of Federal lands in counties where the economic impacts were expected to be the highest. This reduced the expected employment loss and other cost associated with this decision by 41 percent. The Service excluded all state, tribal, and private lands from critical habitat; the Service believed that the costs outweighed the conservation benefits to be gained from including them in the designation. For the northern spotted owl, the majority of conservation activities would take place on Federal lands.*
>
> . . . .
>
> *The ISC Plan estimated that 20-30 percent of the HCA acres outside of wilderness and parks were reserved locally (e.g., streamside or scenic corridors), were areas unsuitable for timber harvest (e.g., unstable soils), or were set aside for other reasons (e.g., bald eagle nest sites). These percentages indicate that of the 6.0 million acres in HCAs outside of wilderness or parks, only 4.2 to 4.8 million acres were suitable for timber harvest. Similarly, of the 6.9 million acres in critical habitat, about 4.8-5.5 million acres may actually be lands available for timber harvest. The final critical habitat designation is within 13 percent of the ISC estimate of lands available for harvest.* [NFRC Exhibit 13, pages 1, 5]

In its planning for FY 1991 timber sales, the Bureau of Land Management was sensitive to the changing decision environment that resulted from the report of the Interagency Scientific Committee and from the listing of the northern spotted owl. The Bureau provided the following guidelines, commonly referred to when it was issued in 1991 as the Jamison strategy, to its Westside Oregon District Managers as an interim strategy until the Bureau completed its resource management plans for the 1990s decade beginning in FY 1993: [FWS Exhibit 5, pages 1-2]

> *1. No regular green timber sales will be offered within the 110 spotted owl habitat sites established under the 1987 agreement between BLM and ODFW* [Oregon Department of Fish and Wildlife], *and the additional*

> *12 sites identified under Section 318 of Public Law 101-121. Any salvage sales will require concurrence of the ODF&W.*
>
> 2. *Avoid placement of regular green timber sales in proposed Habitat Conservation Areas (HCAs) Categories 1, 2, 3 and 4 of the Interagency Scientific Committee (ISC) Report. HCA Categories 1 and 2 have boundaries mapped as delineated in the report. Categories 3 and 4 have been preliminarily mapped based on currently known owl sites. Category 3 criteria also calls for protecting future pairs. Follow the BLM guidelines for surveying timber sales for spotted owls (a minimum of 6 nighttime surveys) to verify the presence or absence of new owl sites within the areas subject to Category 3 criteria. Salvage sales or commercial thinnings are permissible where, in our judgement, there will be little impact on spotted owl populations or critical habitat.*
>
> 3. *It will not be necessary to apply the ISC report's "50-11-40 rule" in developing the FY 1991 timber sale plans. However, if it is possible to honor this rule for 1991, please do so.*

With its checkerboard pattern of land ownership, the Bureau of Land Management normally owns half or less of the land in each quarter township. If all of the intervening private lands were clearcut in the past 40 years, the quarter township would necessarily be at or under "50-11-40" if all ownerships were included in the calculation, even if the Bureau of Land Management's holdings entirely constituted unharvested old-growth forest. To take multiple ownerships into account, the Standards and Guidelines of the Interagency Scientific Committee provide for separate computation for each owner when the quarter township contains multiple ownerships. [FWS Exhibit 15, Appendix Q, page 327]

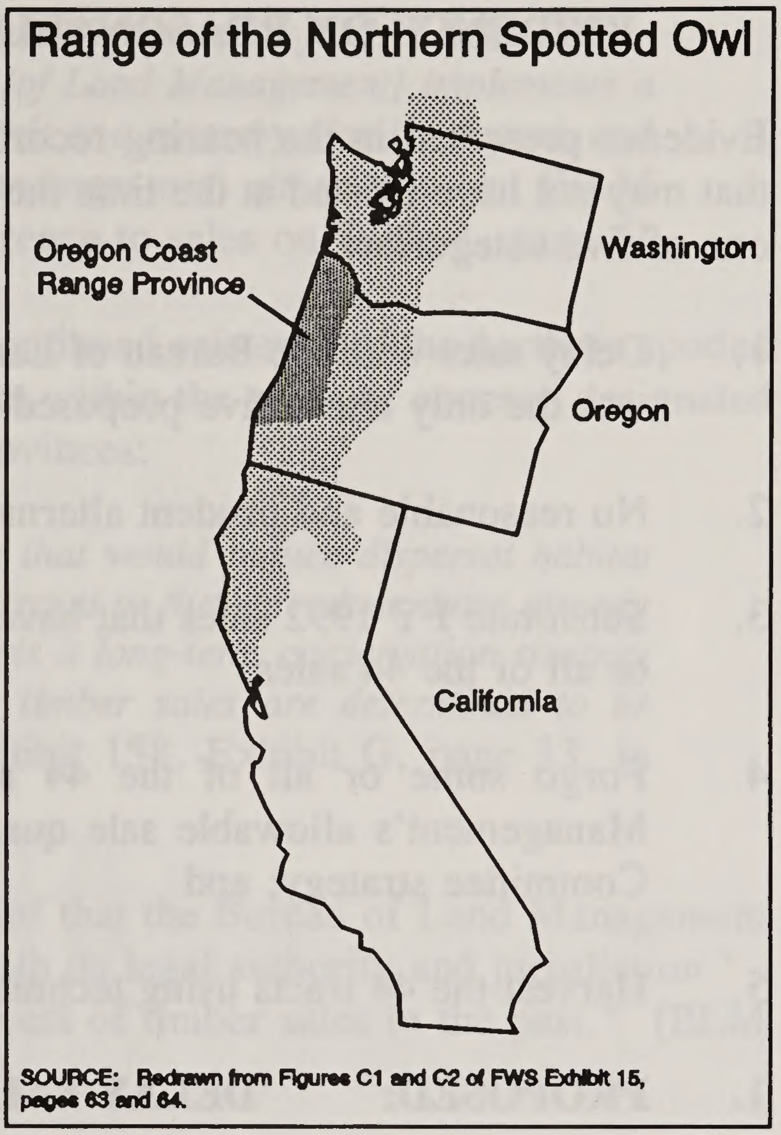
During consultation, the Fish and Wildlife Service applied the "50-11-40" test only to the Bureau of Land Management land in each quarter township, consistent with the Standards and Guidelines of the Interagency Scientific Committee. [Gary Miller, a Fish and Wildlife Service witness, transcript, pages 3234-3236] Of the 44 sales, 39 were each given a jeopardy opinion at least in part because the Bureau of Land Management portion of the quarter township would fall below "50-11-40." [BLM Exhibit 158, Appendix G, Appendix 1]

The Interagency Scientific Committee also identified a set of "Areas of Special Concern," one of which was the Oregon Coast Range Physiographic province (Shown in Figure 1.2).

> *Within this area, the known owl population is extremely low compared to other areas in the State. Existing data indicate 102 known pairs of spotted owls in the*

> *entire area, a density of only 0.015 pairs per square mile. This density is only 1/8 that recorded in a study area in the Coast Range outside the area of concern. This low density parallels an equally dire scarcity of suitable owl habitat. Most of the forest is <80 years old, and the remaining areas of older forest are scattered across the landscape and becoming increasingly isolated.* [FWS Exhibit 15, page 67]

David Johnson, a Fish and Wildlife Service witness, testified that he had recently compiled data on spotted owl pairs within the Oregon Coast Range and determined that a total of 284 owl pairs have been recorded while noting that some sites may no longer exist. David Johnson testified that the density of owls in the Coast Range province was still less than half that for the other three Oregon provinces in which spotted owls are found. [Rebuttal Affidavit of David Johnson, page 2]


Range of the Northern Spotted Owl
Oregon Coast Range Province
Washington
Oregon
California

SOURCE: Redrawn from Figures C1 and C2 of FWS Exhibit 15, pages 63 and 64.

Figure 1.2

Gary Miller, a Fish and Wildlife Service witness, testified that

> *None of the provinces are in pristine condition. All of them have suffer losses and fragmentation of natural forest habitat. Placing increased stress on the Oregon Coast Ranges increases the risk to the other provinces.* [Affidavit of Gary Miller, page 5]

Barry Noon, a Fish and Wildlife Service witness, testified that ". . . there is very strong and convincing empirical evidence that even in terms of spotted owls, the forest systems in Western Oregon are in decline." [Transcript, page 3619]

In its application, the Bureau of Land Management summarized the reasons given in the biological opinion of the Fish and Wildlife Service for the jeopardy opinion. Of the 39 sales in the Coast Range Province, 20 were due to dispersal habitat, five due to take of known owls, and 14 for both reasons. The five sales not in the Coast Range Province were given jeopardy opinions because they were in areas of concern which provide cross linkages between provinces and are deemed important for owl dispersal.

EVIDENCE ON REASONABLE AND PRUDENT ALTERNATIVES

Evidence presented in the hearing record related to reasonable and prudent alternatives that may not have existed at the time the application was filed can be summarized under one of five categories:

1. Delay sales until the Bureau of Land Management develops an owl strategy. This was the only alternative proposed as part of the consultation process;

2. No reasonable and prudent alternatives exist;

3. Substitute FY 1992 sales that have received a draft no-jeopardy opinion for some or all of the 44 sales;

4. Forgo some or all of the 44 sales in order to make the Bureau of Land Management's allowable sale quantity consistent with the Interagency Scientific Committee strategy; and

5. Harvest the 44 tracts using techniques other than clearcutting;

1. PROPOSED: DELAY SALES OF THESE TRACTS

The Endangered Species Act provides that, if in the Section 7 consultation process

> . . . jeopardy or adverse modification is found, the Secretary [In the Department of the Interior, this authority has been delegated to the Director of the Fish and Wildlife Service] *shall suggest those reasonable and prudent alternatives which he believes would not violate subsection (a)(2) and can be taken by the Federal agency or applicant in implementing the agency action.* [Endangered Species Act, Sec. 7(b)(3)(A)]

Fish and Wildlife Service Proposals

In its biological opinion, the Fish and Wildlife Service proposed two variants of a potential reasonable and prudent alternative:

For those sales likely to jeopardize the continued existence of the northern spotted owl because of existing degraded habitat condition, take of known sites, and reduction of dispersal habitat in the Coast Range physiographic province:

> *Defer offering that portion of a timber sale that lies within the provincial home range radius of known pairs and resident singles, or that would reduce dispersal*

> *habitat conditions in 1/4-townships to less than 50 percent or further reduce those already below 50 percent until the Bureau [of Land Management] implements a long-term conservation strategy for spotted owls or a recovery plan is adopted, and these timber sales are determined to be consistent with either strategy.* [BLM Exhibit 158, Exhibit G, page 33, in reference to sales on Table 1, page 4]

For those sales that are likely to jeopardize the continued existence of the northern spotted owl because of the reduction of dispersal habitat within the areas of concern designated for linkage across and within physiographic provinces:

> *Defer offering that portion of a timber sale that would reduce dispersal habitat conditions in 1/4-townships to less than 50 percent or further reduce those already below 50 percent until the Bureau implements a long-term conservation strategy or a recovery plan is adopted, and these timber sales are determined to be consistent with either strategy.* [BLM Exhibit 158, Exhibit G, page 33, in reference to sales on table 2, page 5]

The Fish and Wildlife Service indicated its belief that the Bureau of Land Management could implement these alternatives consistent with its legal authority and jurisdiction " . . . because the Bureau has chosen to defer harvest of timber sales in the past." [BLM Exhibit 158, Appendix G, page 34]

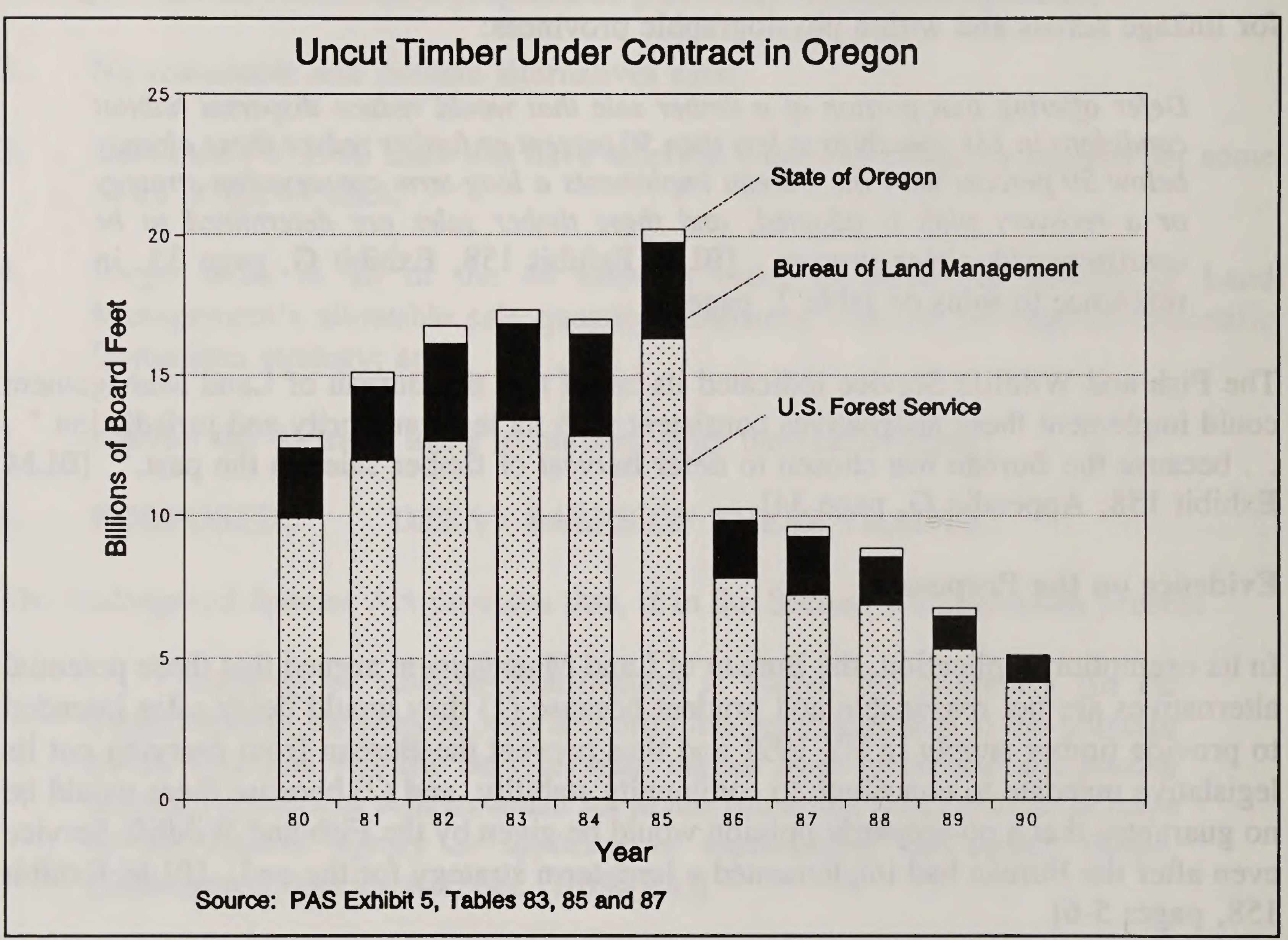
Evidence on the Proposals

In its exemption application, the Bureau of Land Management argued that these potential alternatives are not reasonable and prudent because (1) they would delay sales intended to provide timber supply in FY 1991 and thus prevent the Bureau from carrying out its legislative mandate to contribute to community stability, and (2) because there would be no guarantee that a no-jeopardy opinion would be given by the Fish and Wildlife Service even after the Bureau had implemented a long-term strategy for the owl. [BLM Exhibit 158, pages 5-6]

Paul Ehinger, a Northwest Forest Resource Council witness, testified:

> *The basic and simple answer is that there are no other alternatives. The loss of this volume translates directly to loss of employment, closure of mills, and economic disaster for the involved communities beginning now and carrying through the next 12 to 18 months. Time is of the essence in the current situation.*
>
> . . . .
>
> *Delays in timber sale programs today cannot be offset by accelerating harvest at a later date, there simply is nothing to take the place of sales not offered today and the current process for preparing sales has proven to have no ability to catch up later -- what's lost is lost!* [Affidavit of Paul Ehinger, pages 2-3]

Figure 1.3 shows the quantity of timber volume uncut but under contract between 1980 and 1990. The data are all on the long-log scale. Data for the State of Oregon lands for 1990 were not available; the absence of data should not be assumed to be zero. The large decrease from 1985 to 1986 was due largely to the returning to the Bureau of Land Management and the U.S. Forest Service of substantial volumes of timber under contract through the provisions of "Buyout" legislation, described later in the Chapter under potential alternative number 4.



Source: PAS Exhibit 5, Tables 83, 85 and 87

Figure 1.3

The long-log scale and short-log scale are two ways of estimating timber volume in board feet. The short-log scale results in an estimate that is approximately 19 percent higher than the estimate based on the long-log scale. While there is probably no way to completely eliminate confusion because different witnesses used, and reported, estimates based on different methods, reference will be made in this report to state the method used where it relates to calculations made by the authors.

Mark Rasmussen, a Northwest Forest Resource Council witness, testified that there are 1,258 MMBF remaining in sold-but-uncut Bureau of Land Management timber inventory of companies in Western Oregon and that the average harvest for the period 1988-1990 was 870 MMBF per year. [Affidavit of Mark Rasmussen, table 4, page 17] Under cross examination by Mr. Parenteau, Counsel for the Fish and Wildlife Service, Mark Rasmussen agreed, subject to the objection that this would not apply equally to all companies, that an average of 17 months of Bureau of Land Management timber remained in sold-but-uncut inventory at the time of the January, 1992, hearing. [Mark Rasmussen, transcript, pages 1344-1355]

Mark Rasmussen's calculations of the three-year average are lower than other sources of harvest on Bureau of Land Management lands. Bureau of Land Management witness William McKillop data show a three-year average of 1,062 MMBF [Affidavit of William McKillop, Attachment 1] and data from the State of Oregon (utilized in Figure 1.4, below) indicate a three-year average of 1,014 MMBF. Both of these were calculated on the long-log scale; averages based on the short-log scale used by the Bureau of Land Management would be 19 percent higher.

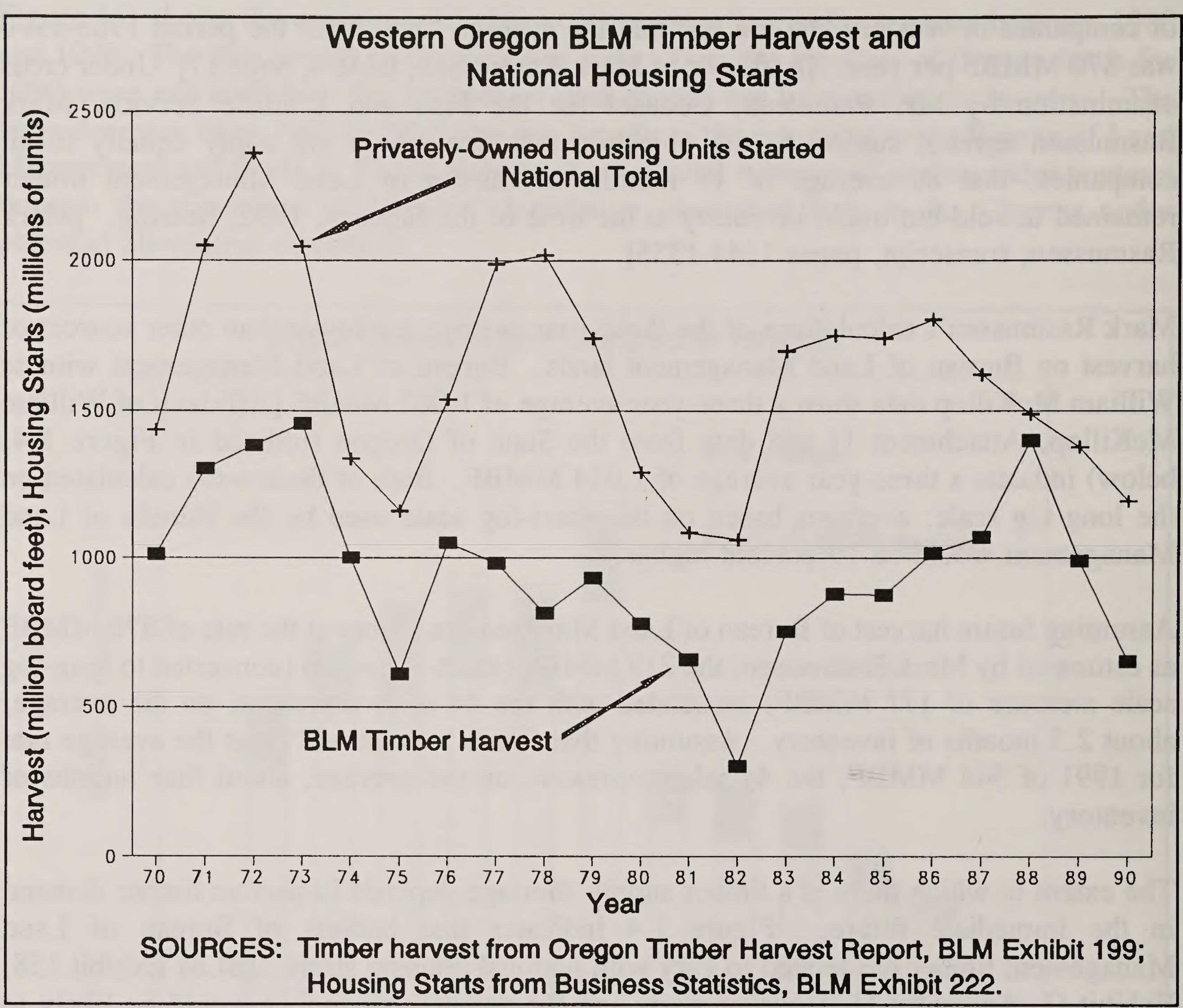
Assuming future harvest of Bureau of Land Management timber at the rate of 870 MMBF as estimated by Mark Rasmussen, the 219 MMBF (short-log scale) (converted to long-log scale measure of 177 MMBF) associated with the 44 sales represent, on the average, about 2.5 months of inventory. Assuming that future harvest will be at the average rate for 1991 of 544 MMBF, the 44 sales represent, on the average, about four months of inventory.

The extent to which there is a timber supply shortage depends in part on timber demand in the immediate future. Figure 1.4 indicates that harvest of Bureau of Land Management timber has tended to vary with national housing starts. [BLM Exhibit 158, Exhibit G, Appendix 1] Housing starts and the demand for timber would be likely to increase as the current recession ends and the recovery takes place.

Witnesses were not in agreement in their assessment of how the demand for timber will change in the immediate future. On the one hand, William McKillop, a Bureau of Land Management witness, testified that timber demand will rise in the near future based on housing starts and other factors:

Cross-examination by Mr. Parenteau, Counsel for the Fish and Wildlife Service:

> *Q.* *And demand in your judgment is driven in large part by housing starts in the lumber and wood products industry?*
>
> *A.* *It used to be driven mainly by that, but we have had a lot of -- as money got tighter and mortgage rates went up, a lot of folks got into remodeling and repair of existing homes. So it's not quite as crucial as it was before.*



SOURCES: Timber harvest from Oregon Timber Harvest Report, BLM Exhibit 199; Housing Starts from Business Statistics, BLM Exhibit 222.

Figure 1.4

But the two things are linked through the mortgage rates or home equity rates, so you know they are both going to come down -- there's going to be more remodeling and repair, there's going to be more housing starts in this year. So the two things are going to go together in this case.

Q.	*So you think there are going to be more housing starts this year. Right?*
A.	*Yes.*

. . . .

Q.	*Substantial increase?*
A.	*I think so.*

. . . .

Q.	*But a percentage. How much percentage increase would you say?*
A.	*I would imagine up to 1.2 million, something like that.* [Transcript, pages 4033-4034] [NOTE: Housing starts for 1991, the most

> current period at the time of the hearing, were 1,013,900 units. These 1991 data are not in the record, but data for earlier years were in BLM Exhibit 222. David Cox, on page 5 of his rebuttal affidavit, testified that 1991 housing starts "totaled about 1.0 million units"]

On the other hand, W. Ed Whitelaw, a Fish and Wildlife Service witness, foresaw slow growth:

> *The market for timber from the Douglas fir region (western Oregon and Washington) is constrained by low demand, not by a shortage of supply. Inventories of timber available for harvest are likely to remain high enough, and the demand for timber, at least through 1993, is likely to remain low enough that the timber industry is unlikely to harvest and process additional timber in the near future if the BLM is granted an exemption and places the 44 sales on the market. Hence, deferring the 44 timber sales from FY 1991 to FY 1993, and having substitute sales available to be placed on the market if the demand for timber unexpectedly surges, is a reasonable and prudent alternative to granting BLM's request for an exemption.* [Affidavit of W. Ed Whitelaw, page 2]

Jeffrey Olson, a Portland Audubon Society witness, testified that it does not matter to the regional or national timber industries or the economy whether the Bureau of Land Management sells 44 timber sales immediately or defers the sales, because of low demand for timber, a general recession, and housing starts at their lowest level since World War II. Jeffrey Olson anticipates continued low demand for 1992. [Affidavit of Jeffrey Olson, page 3]

[Court decisions issued by the 9th Circuit Court of Appeals (San Francisco) enjoined all of the Bureau of Land Management's FY 1992 sales as well as some unawarded prior year sales. The outcome of these court actions may affect the Bureau's ability to substitute FY 1992 or other timber sales. Questions about the status of suits against the Bureau of Land Management, and other legal issues, can be addressed to Counsel to the Endangered Species Committee.]

2. PROPOSED: THERE ARE NO REASONABLE AND PRUDENT ALTERNATIVES

Bureau of Land Management witnesses testified that there are no reasonable and prudent alternatives available to replace the 44 sales. Additionally, Bureau of Land Management personnel discussed several potential alternatives which others put forward as reasonable and prudent, and offered reasons why these would not be acceptable. For example, William Bradley of the Bureau of Land Management testified as to why certain alternatives are not available to the Bureau of Land Management [Affidavit of William Bradley, pages 7-12]:

- **Bringing FY 1992 sales into the FY 1991 program.** This would require about one-third of the proposed FY 1992 sales and would exacerbate the supply situation in future years. [See additional discussion under Testimony Category 3, below]

- **Alternative methods of harvesting, such as partial cutting and selective harvest.** Clearcutting is preferred because Douglas fir does not grow well under shade, and clearcutting lends itself to post-logging forestry practices. [See additional discussion under Testimony Category 4, below]

- **Accelerating future sales.** Too much lead time is required to prepare sales.

- **Concentrating sales only in quarter townships where the "50-11-40" rule would not be violated.** It may require as much as 40 years to meet the criteria in some quarter townships, and may concentrate sales in certain drainages resulting in other environmental consequences.

Variants of these arguments, consistent with William Bradley's conclusions, were offered by other Bureau of Land Management witnesses, including Eugene Chouinard, Kevin Carson, Michael Creswell, Chris Hamilton, Peter Kirk, Jon Menten, Steven Niles, Frank Price, David Sherman, Robert Towne, and Barry Williams, as well as O&C witness David Cox.

3. PROPOSED: SUBSTITUTE SOME OF THE FY 1992 SALES

The primary source for this proposal is the direct testimony of Teresa Nichols of the Fish and Wildlife Service. Teresa Nichols testified that the Fish and Wildlife Service, on December 3, 1991, gave draft no-jeopardy opinions on 82 sales in the Bureau of Land Management's FY 1992 timber program totaling 383 MMBF. [Affidavit of Teresa Nichols, page 20] On cross-examination, Teresa Nichols clarified that, because reasonable and prudent alternatives must meet both Fish and Wildlife Service and Bureau of Land Management tests, she could speak only to their acceptability from the standpoint of owl biology.

Under cross-examination by Mr. Rutzick, Counsel for the Northwest Forest Resources Council:

> *Q.* *Ms. Nichols, on page 21 of your testimony, you suggest that 1992 timber sales could be substituted for the 44 1991 timber sales that we are talking about in this hearing. Correct?*

A. *I said that from the standpoint of the spotted owl they could be, they could be substituted.*

Q. *Are you testifying that 1992 timber sales are a reasonable and prudent alternative to these 44 timber sales?*

A. *I am testifying that from the standpoint of the spotted owl, if you needed to meet a volume target in -- in this time frame, that those sales have passed consultation for the spotted owl.* [Transcript, pp. 3349-3350]

Bureau of Land Management witness Jon Menten testified that the Bureau of Land Management already had moved some FY 1992 and 1993 sales into the FY 1991 program and they could not move any more. [Affidavit of Jon Menten, page 5]

William Bradley, a Bureau of Land Management witness, testified that, of the 750 MMBF intended for sale in FY 1991, 443 MMBF were offered, 219 MMBF are in the exemption request, 52 MMBF were carried over and would be offered in FY 1992, and the remaining 36 MMBF would be "deferred or lost to the market as a result of new owl discoveries and consultation with the Fish and Wildlife Service." [Affidavit of William Bradley, page 16]

Deane Haack, a Bureau of Land Management witness, testified that substituting FY 92 sales and future sales for the 44 tracts cannot be done because of legal constraints, lags in the planning process, the age of trees, and the potential that the Fish and Wildlife Service would find jeopardy on future sales. There are no replacements, according to Deane Haack, for sales units taken from future-year plans. [Affidavit of Deane Haack, page 6]

Substitution of any FY 1992 sales for FY 1991 sales likely would redistribute employment effects because they would not necessarily be located in the same places, and hence employ the same workers and be processed at the same mills. Table 1.2 shows the extent to which the FY 1992 no-jeopardy sales referred to by Teresa Nichols are located in the same Bureau of Land Management Resource Areas as the 44 FY 1991 sales. BLM Resource Areas were used for this table because data on location of sales by county were not available in the record. In most cases, resource areas are smaller than counties.

While Resource Areas do not necessarily follow county boundaries, generally: The Yamhill Resource Area includes the FY 1991 sale areas in Yamhill, Polk and Lincoln Counties; Lane County includes the Coast Range, South Valley and most of the McKenzie Resource Areas; Douglas County includes the Umpqua, Drain, Dillard, Glendale North Umpqua and South Umpqua Resource Areas; and Coos County is located in the Tioga Resource Area and a small portion of the Myrtlewood Resource Area.

Table 1.2

Location of FY 1992 "No Jeopardy" Sales in Relation
to the 44 Sales in the Exemption Request
(in millions of board feet)

BLM Resource Area	FY 1991 "Exemption" Sales	FY 1992 "No Jeopardy" Sales
Yamhill	17.542	17.7
Coast Range	17.572	1.6
Umpqua	43.954	3.2
Drain	38.750	11.4
Tioga	23.424	10.1
Dillard	21.799	10.2
Myrtlewood	26.511	53.5
South Valley	19.529	14.6
South Umpqua	9.571	34.8
Subtotal	218.652	157.1
Other Resource Areas	0.000	272.6
Total	218.652	429.7

SOURCES: For FY 1991, BLM Exhibit 158, Exhibit G; for FY 1992, FWS Exhibit 13]

[It should be noted that the draft no-jeopardy opinion for the 82 FY 1992 sales cited by Teresa Nichols was issued before the Fish and Wildlife Service published the final rule designating critical habitat for the northern spotted owl. That rule was issued January 15, 1992 (50 CFR 17; 57 FR 1796). Federal agencies must consult on any action that affects listed species or critical habitat (50 CFR 402.14). As noted in the final critical habitat rulemaking, "the requirement to consider adverse modification of critical habitat is an incremental Section 7 consideration above and beyond section 7 review necessary to evaluate jeopardy and incidental take." Based on the final rule, the Bureau of Land Management has determined that 11 of the 82 no-jeopardy sales in its FY 1992 program required formal consultation with respect to critical habitat. In addition, the Bureau of Land Management is informally conferencing on 14 of the 82 sales with respect to potential effects on the marbled murrelet, which was proposed for listing as a threatened species on June 20, 1991 (56 FR 119); one of these sales is also among the 11 noted above which are being consulted on regarding effects on critical habitat for the northern spotted owl. Consequently, 25 of the 82 sales for which no-jeopardy opinions were issued in December, 1991, are involved in new conferencing. Furthermore, court decisions issued by the 9th Circuit Court of Appeals (San Francisco) enjoined all of the Bureau of Land Management's FY 1992 sales as well as some unawarded prior year sales.]

4. PROPOSED: MAKE THE ALLOWABLE SALE QUANTITY CONSISTENT WITH THE INTERAGENCY SCIENTIFIC COMMITTEE STRATEGY

In rebuttal testimony, Alan McQuillan, a Fish and Wildlife Service witness, referred to FWS Exhibit 46, a one page table taken from page 8 of an April 1990 document, attributed to the Forestry staff of the Oregon State Office of the Bureau of Land Management. Exhibit 46 contains calculations of maximum sustained yield and acreages affected by several incremental applications of the Interagency Scientific Committee strategy, including Habitat Conservation Area categories 1 through 4, and application of the "50-11-40" rule.

Alan McQuillan testified that FWS Exhibit 46 represents the Bureau of Land Management's calculations that the maximum sustained yield would be 604 MMBF if the Bureau removed from the available timber base all of the Interagency Scientific Committee's Habitat Conservation Areas, and 443 MMBF if the Bureau removed all quarter townships under "50-11-40". On this basis, Alan McQuillan testified that not offering the 44 sales, or at least not offering that portion in excess of the recalculated maximum sustained yield, constitutes a reasonable and prudent alternative. [Rebuttal affidavit of Alan McQuillan, pages 6-7]

Ronald Sadler, a Fish and Wildlife Service witness and retired Bureau of Land Management employee, testified that the Bureau of Land Management's staff analysis, as represented by FWS Exhibit 46, indicates that a timber sale offering of 443 MMBF would preserve the option of fully implementing the Interagency Scientific Committee strategy, and could have been sustainable indefinitely. [Affidavit of Ronald Sadler, page 13]

Robert Metzger, a Bureau of Land Management witness, testified in rebuttal to Ronald Sadler, that "the timber sale targets were set at 750 . . . following consultation with field managers as to what was realistically attainable." [Rebuttal affidavit of Robert Metzger, page 6]

Robert Metzger testified that, contrary to Ronald Sadler's affidavit, the Bureau of Land Management had not pushed its allowable sale quantity beyond reasonable limits in the 1980's decadal plan, indicating that the Bureau actually had sold about 1,900 MMBF less during the 1984-1990 period than the cumulative planned allowable sales under the 1983-1992 decadal plan. There were, according to Robert Metzger, two major reasons for this, in addition to annual shortfalls in sales. First, about 1,300 MMBF that had been removed from the Bureau's inventory in the 1970's decadal plan, was put back into the timber inventory under the Federal Timber Contract Payment Modification Act (P.L. 98-478, June 27, 1985). Commonly known as the "Buyout Act," this legislation allowed certain purchasers to pay fees in lieu of fulfilling their contracts. By law, resale of these tracts was to count against the Annual Sale Quantity for the 1983-1992 decadal plan and not be sold as additional inventory. About 1,000 MMBF were resold. Second, Section 318 of the Department of the Interior FY 1990 Appropriations Bill (P.L. 101-121) limited the Bureau of Land Management to a total of 1,900 MMBF for two years, " . . . compared to a normal ASQ level of 2,352 million board feet for those two years." [Rebuttal affidavit of Robert E. Metzger, pages 8-10]

However, in cross-examination, Robert Metzger testified that the Bureau of Land Management had done calculations indicating that owl restrictions may result in allowable sale quantities less than the 750 MMBF level proposed in the Jamison strategy:

Cross-examination by Mr. Sher, Counsel for the Portland Audubon Society:

> *Q.* *Taking that as the available -- that is, taking the forested lands that BLM manages as the available universe for timber sales and placing those restrictions on where timber sales can be placed, what is the sustainable -- let me ask the question this way. Have you calculated what the timber productivity of the remaining lands for timber production are, given those constraints.*
>
> . . . .
>
> *A.* *It basically -- and I am not going to be able to give you an answer. I can tell you that BLM staff, my staff at that time and perhaps it's the -- just mostly that same staff continuing working for BLM today, has made numerous calculations of scenarios with certain restrictions on owls, and some figures have come out on that.*
>
> *Q.* *Is 750 million board feet a sustainable level on that land base?*
>
> *A.* *Based on the analysis I have seen of BLM, there was one that got it down to nearer to 500 million board feet a year. Again, I can't tell you for sure what scenario it had in it. But that 750, I do not believe was a cut level that was aimed at a long-term sustained yield allowable cut. It was an interim effort to keep the timber sale program going while providing as many options as possible for the 1990s plans which are now in development.* [Transcript, pages 4232-4233]

William Bradley of the Bureau of Land Management also testified that the 750 MMBF were interim targets and that the allowable annual sales under the Interagency Scientific Committee strategy would be lower:

Cross-examination by Mr. Parenteau, Counsel for the Fish and Wildlife Service:

Q. *The Jamison strategy established a lower allowable sale quantity. That's why I wanted to do this first before we get to the 1993 plans. I promise you we will get there.*

A. *Yes, that's correct.*

Q. *That allowable sale quantity is 750 million board feet?*

A. *For 1991, that's correct.*

Q. *For 1992?*

A. *No it's 729 million board feet.*

Q. *729 for 1992?*

A. *That's correct.*

Q. *And that's an interim plan to get you to the next ten-year plan?*

A. *It's an interim strategy, yes.*

Q. *Isn't it true that if you were to calculate a sustained yield, given the ISC strategies recommendation to not harvest the HCAs, that the sustained yield would be closer to 600 million board feet a year?*

A. *It would be less than the 750.*

Q. *And if you were to comply with the 50-11-40 rule recommended by the ISC strategy, that would further lower the ASQ to somewhere around 400 million board feet; is that right?*

A. *Between 400 and 500, yes.*

Q. *And those are options, I take it, for the 1993 planning process?*

A. *That's correct.* [Transcript, pp 1054-1055]

5. PROPOSED: USE HARVEST TECHNIQUES OTHER THAN CLEARCUTTING

Jon Stewart, a Fish and Wildlife Service witness, proposed thinning of forests rather than clearcutting, in order to provide continuing owl habitat and logging employment. He provided no information on the alternative costs or on the employment potential of logging by thinning compared to clearcutting. [Rebuttal affidavit of Jon Stewart, page 2]

Chris Hamilton of the Bureau of Land Management testified that the Timber Management Environmental Impact Statement and Record of Decision states that clearcutting is the primary harvesting method for this 10 year period. [Affidavit of Chris Hamilton, page 7] Other Bureau of Land Management witnesses provided the same testimony.

David Sherman, a Bureau of Land Management forester, testified that clearcutting provides an environment for achieving "maximum growth rates thus producing the largest volume of timber in the shortest amount of time." [Affidavit of David Sherman, page 4]. David Sherman cited 13 reasons why, in the experience of the Coos Bay District

Silviculturist, clearcutting is used. They include such factors as adequacy of re-stocking of desired species of trees, mimicking natural fire systems, avoiding excessive windfalls and the intrusion of brush species, efficiency of harvest, and minimizing of road construction. [Affidavit of David Sherman, Attachment 1]

Bureau of Land Management witness William Bradley testified that there are benefits to clearcutting: "Clear cutting also tends to favor early seral stage wildlife species including popular big game animals such as deer and elk due to new browse and forage which appears in recently cut over areas." [Affidavit of William Bradley, page 10]

Jon Menten of the Bureau of Land Management testified that alternative harvesting techniques are more expensive to prepare by a factor of 1.5 to 3.5 and that the Bureau of Land Management budget is insufficient for this increase. [Affidavit of Jon Menten, page 6]

Everett Johnson, a Northwest Forest Resource Council witness, stated that harvesting methods other than clearcutting would raise prices and reduce the supply. According to Johnson, the cost would be "several hundred percent" greater than clearcutting. [Affidavit of Everett Johnson, page 11]

* * * * *

The five potential reasonable and prudent alternatives presented in this chapter are those that were suggested during the consultation process and during the hearing. They are presented here as separate and discrete possibilities. There is no reason why the Endangered Species Committee cannot combine them in various ways to create additional alternatives for consideration.

CHAPTER 2

Nature and Extent of the Benefits and Costs of the 44 Sales

In contrast, clearcutting is rapid. There is ready recognition as adequate of restocking of desired species of trees, [illegible] control [illegible], avoiding excessive windfalls and the [illegible] of brush [illegible] efficiency of harvest, and minimizing of road construction. [Affidavit of [illegible], Attachment 1]

Bureau of Land Management witness William [illegible] testified that there are benefits to clearcutting. "Clear cutting, [illegible] early seral stage wildlife species including popular big game animals such as deer and elk due to new browse and forage which appears in recently cut over areas." [Affidavit of William [illegible], page 10]

[illegible] of the Bureau of Land Management testified that alternative harvesting techniques are more expensive [illegible] 1.5 to 2.5 and that the Bureau of Land Management budget is [illegible] for this purpose. [Affidavit of [illegible], page 5]

[illegible] Johnson, a [illegible], stated that harvesting methods other than clearcutting [illegible] and reduce the supply. According to Johnson, the [illegible] than clearcutting. [Affidavit of [illegible] Johnson, page [illegible]]

* * * * *

The five potential sustainable, and possible alternatives presented in this chapter are those that were suggested during the consultation process and during the hearing. They are presented here as separate and distinct possibilities. There is no reason why the Endangered Species Committee cannot combine them in various ways to create additional alternatives for consideration.

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CHAPTER 2. NATURE AND EXTENT OF THE BENEFITS AND COSTS OF THE 44 SALES

INTRODUCTION

In order to grant an exemption under Section 7 of the Endangered Species Act, the Committee must determine that the benefits of a proposed action clearly outweigh the benefits of alternative courses of action that are consistent with conserving the species or its critical habitat.

This chapter has two major sections:

- The first section describes the conceptual approach taken to estimating the magnitude of the economic benefits and costs of the 44 proposed actions. It describes a conceptual framework for evaluating benefits and costs, outlines the types of benefits and costs asserted in the record, and discusses the economic approach to measuring each of the benefits and costs. Estimates of the dollar value associated with the benefits and costs of the proposed actions are then developed in the second major section of the chapter. The discussion of regional effects in this section does not refer to a specific definition of region, but rather to region generically as a concept.

- The second section parallels the first section in organization, and estimates the magnitude of the benefits and costs of the proposed actions based on information in the record. It builds on the conceptual approach to the economic benefits and costs developed in section 1, and applies it to the effects of the proposed actions and the evidence in the record. The definition of region used in this section to estimate employment effects is the Westside of Oregon.

The Committee must also determine whether a proposed action is of national or regional significance. Chapter 4 of the report uses some of the data presented in this chapter to address the relative magnitude of the effects of the 44 sales on individuals employed in timber related industries and on the O&C counties.

SECTION 1: CONCEPTUAL APPROACH TO ESTIMATING THE BENEFITS AND COSTS OF THE PROPOSED ACTION

FRAMEWORK FOR EVALUATING BENEFITS AND COSTS

In order to make its determination, the Committee must have a consistent and logical basis to decide which claims regarding the benefits of the proposed 44 sales are "valid" (e.g., not double counting) and which estimates of the benefits are most correct. Benefit-cost analysis is a technique commonly used to enumerate the pros and cons of a proposed action, and for placing a value on each consideration. This technique is designed to assess the magnitude of the economic benefits and costs of a particular action and the action's effect on the value of the goods and services produced in society.

There are a number of accepted principles of benefit-cost analysis which apply to the estimation of the magnitude of benefits and costs. The first is that the benefits and costs of a proposed action should be derived by comparing the operation of the economy with the proposed actions and the operation of the economy without them. Estimates of benefits and costs must be based on an understanding of the market process by which the economy responds to the "with" and "without" alternatives. Market valuations provide the best estimates of value in a free-enterprise economy. Where markets have imperfections or do not exist, market values must be adjusted or other techniques must be used to estimate values.

A second principle is that benefits and costs which occur at different times must be compared on a consistent basis. Two important concepts are necessary for this comparison: 1) present value--putting all values, whether benefits or costs, in terms of current dollars, and 2) the discount rate--the rate used to compute the present value of money received in the future.

Special consideration must often be given to the treatment of potential employment and asset value effects of a given action. The primary issue is the extent to which employment and asset value changes can be counted as benefits or costs.

Appendix 1 provides a more detailed and technical discussion of these relationships.

IDENTIFYING ECONOMIC BENEFITS AND COSTS

The record contains a variety of claims and counter claims regarding the effects of the 44 Sales which witnesses contend should be regarded as benefits or costs. These claims address the ways in which benefits arise, the ways in which offsetting costs arise, the distribution of benefits and costs, and the methods and data that are useful for estimating the magnitude of various types of benefits and costs.

This section identifies those effects discussed in the record which are valid national and regional economic benefits and costs. The conceptual approach to evaluating the economic effects of the proposed actions are discussed in the context of a benefit-cost framework and are summarized in Tables 2.1 and 2.2. Estimates of the magnitude of the benefits and costs of the proposed actions are developed in the second major section of the chapter and are summarized in Table 2.3.

Claims of Benefits and Costs Asserted in the Record

The proponents of the proposed actions asserted that the following types of effects are benefits of the proposed actions:

- Avoiding mill closures and job displacement;
- Avoiding losses in Federal revenues and Federal and State taxes;
- Avoiding losses in O&C county receipts;
- Maintaining timber supplies;
- Avoiding environmental damages (stemming from increased production of substitutes); and
- Avoiding adverse sociological effects.

The opponents of the proposed actions asserted the following types of effects constitute the costs of the proposed actions:

- Increased environmental damages;
- Reduced recreation opportunities;
- Increased loss of spotted owl preservation benefits;
- Increased job displacement in non-timber industries; and
- Slower transition to a more diversified Oregon economy.

The above are the benefits and costs claimed by the parties. The next section addresses the valid benefits and costs of the proposed actions. The valid benefits and costs are the concepts used in developing the estimates in Chapters 2 and 3.

Table 2.1. Valid Economic Benefits of the Proposed Action

Timber Production Benefits

National	Western Oregon
Total Stumpage Value: Equal to net Federal timber receipts.	**Share of Federal Timber Receipts:** Set by law, adjusted for safety net.
Silvicultural Benefit: Equal to future Federal timber receipts from same tracts.	**Share of Future Federal Timber Receipts From Same Tracts:** Set by law, adjusted for safety net.
Avoided Timber Supply Response Costs: Avoided costs of increased private timber production and imports nationwide, including environmental costs of the response.	**Portion of Avoided Timber Supply Response Costs:** Portion of avoided costs affecting the region.

Employment Benefits

National	Western Oregon
Higher Wages: Wages above those earned nationwide without the action.	**Higher Wages Within the Region:** Higher incomes within the region due to avoided unemployment, adjusted for transfer payments from outside the region.

Sociological Benefits

National	Western Oregon
Desirable Effects on Individuals, Families, and Communities: Adjusted for offsetting effects of timber response nationwide.	**Desirable Effects on Individuals, Families, and Communities Within the Region:** Adjusted for offsetting effects of timber response within the Region.

Table 2.2. Summary of Valid Economic Costs of the Proposed Action

Economic Costs National	Western Oregon
Recreation Costs: Reduced recreational opportunities. Smaller than regional.	**Recreation Costs Regionwide:** Small.
Decreased Existence Values Experienced: Unpriced. Record indicates adverse effects from cumulative withdrawals. Record silent on effect of 44 sales.	**Decreased Existence Values Experienced Regionwide:** Smaller than national.
Other Environmental Costs: Unpriced. Avoided adverse environmental effects in other timber producing regions reduce costs.	**Other Environmental Costs Regionwide:** Unpriced. Record indicates adverse effects from timbering generally and potential effects from the 44 sales.

1. ECONOMIC APPROACH TO ASSESSING NATIONAL BENEFITS

In economic terms, the valid types of benefits from timber harvest are as follows:

- The economic value of the timber to be harvested, called the stumpage value, which is captured in the net Federal receipts from the timber sales;
- The income that can be realized from future timbering on the harvested land following replanting and regeneration;
- Wages earned by workers and income earned by owners of capital equipment above what they would earn in alternative employment; and
- The avoided costs which producers and consumers would have incurred in the form of higher timber prices had the sales not proceeded.

Avoiding adverse sociological and psychological effects which are associated with not proceeding with the proposed actions may also be a benefit of the proposed actions, although such non-market effects are less easily quantified for inclusion in a benefit-cost framework.

Stumpage Value

For most resources, the income earned by a resource owner is the difference between the market value of the resource and the costs incurred in production activities. Thus, the primary benefit of the 44 proposed timber sales is the value of the logs that would be harvested less the cost of timbering and transporting the logs to mills for processing. For timber, this value is called the stumpage value. Given that this value is competitively determined in the market place, stumpage value is the best single measure of value of the timber and the contribution which the timber resource to be harvested from the 44 tracts can make to the output of the U.S. economy. [See the following standard reference: Walter J. Mead, et al., "The Economic Consequences of Preserving Old Growth Timber for Spotted Owls in Oregon and Washington," University of Santa Barbara, May, 1991, page iv.]

The stumpage value of the trees in a given stand depends on the characteristics of those trees (such as species and size), on the location of the stand and the terrain conditions, and on market conditions. The landowner, in this case the Bureau of Land Management, captures this value in the form of receipts through competitive sale of the right to harvest the timber.

Silvicultural Value

The economic value of the silvicultural benefit results from the capacity of the land to grow new trees after harvest. Young trees grow substantially faster than the existing older trees and thus contribute to the creation of timber for the future. The future stumpage value of regenerated timber is a benefit that can be anticipated by the landowner.

Employment and Assets

Income is earned by timber workers in the form of wages and salaries used to cut trees, transport logs, and process timber into wood products. However, only the amount of income which labor could earn in excess of what it would earn if the sales did not occur can be counted as an economic benefit of the proposed actions. The opportunity cost of labor (the value of the output it could produce elsewhere) is the amount it could earn in alternative employment.

This type of income differs from the income earned by timberland owners and at least some of the owners of capital equipment (in particular, mill owners). The workers can contribute to the output of the economy and earn income in their alternative occupations. By comparison, the only way to realize the market benefits of the timber in question is to harvest it. Some of the capital resources (e.g., transportation equipment) may have alternative uses, but a large proportion will have limited alternative uses. The milling equipment has little or no alternative uses: it can only be used to process logs into lumber.

Timber Supply Response

The proposed sales are part of the overall contribution which Federal forestland makes to the supply of timber. Given that the greater the supply of a resource the lower its price, timber prices will tend to be lower if the proposed actions go forward than if the tracts are withdrawn. To the extent that the proposed actions are significant enough to affect prices, higher prices that would result from not implementing the proposed sales tend to induce a variety of responses from private individuals and firms through normal market processes. Such responses would help the economy to adjust to the lower supply of timber, mitigating its effect on the total output of the economy. The trees harvested elsewhere contain stumpage value and serve to offset any loss from not harvesting the proposed tracts.

When timber prices rise, mills purchase fewer logs and make smaller profits from milling. Mills may close and labor may be displaced in the milling industry. This idling of timber industry resources if the proposed actions are not undertaken leads to lower income. The higher incomes that result from the proposed sales measure the benefit of productively employing these resources. Part of the economic adjustment to not proceeding with the 44 sales would be to make these resources available for alternative uses.

Higher timber prices would also tend to induce greater rates of timber harvest from other sources. Other potential sources include other Federal forestland, private forestland, or forestland in other countries. Avoiding any increased costs resulting from harvesting in other areas is a valid economic benefit of the proposed sales, including any adverse environmental effects. This cost increase would reduce the overall national benefits from the increased supply of timber. The avoidance of such increased costs of the timber that will be used in the U.S. economy is a valid benefit of the proposed sales.

Higher timber prices may also induce substitution of other materials for lumber. The extent to which this may occur depends on the prices of substitutes and other factors. A national cost may be incurred should the use of more costly substitutes increase.

A related effect of higher timber prices is higher stumpage values for timber that would have been harvested even if the proposed actions went forward. In effect, the owners of these resources benefit at the expense of the mills that pay higher prices for timber. The gains to forestland owners are offset by the losses to mill owners. Thus, there are no national benefits, only transfers between the two groups.

There are likely to be environmental costs associated with the timber response. These environmental effects depend on the location of the added timber harvest and the forest practices used in harvesting and regeneration.

Sociological Effects

Sociologists have identified patterns of individual, family and community responses to changes in economic conditions that suggest an additional type of benefit from the proposed actions. To the extent that responses to proceeding with the proposed sales would lead to behavior patterns which people value more positively than the behavior patterns that would result from withdrawal of the sales, there is a benefit or an avoided social cost. The extent to which this is a national benefit depends on the magnitude of offsetting gains or losses.

2. ECONOMIC APPROACH TO ASSESSING NATIONAL COSTS

Harvest and Production Costs

The primary market-valued costs of the proposed actions are the labor, materials, and equipment that would be used in harvesting timber on the 44 tracts, as well as any administrative costs associated with the sales. These costs are subtracted from the value of the logs produced in determining the stumpage value.

Environmental and Recreational Costs

Environmental damages resulting from the harvesting of timber on the 44 tracts are also valid national costs. These include such effects as reduced water quality and wildlife habitat. Recreational opportunities may also be reduced by harvesting the 44 tracts. The difference between the value of forgone recreation and the value of recreation in areas used instead is a valid cost of the proposed sales.

Existence Values

Economists have recognized that people believe that environmental resources such as forest ecosystems have value even though they have no expectations to use the resources in question. Such values are called existence values. Although there is controversy among economists concerning their measurement and use within the cost-benefit framework, to the extent that people value the existence of the spotted owl species and the forest ecosystems in which they live, the proposed actions have costs resulting from loss or diminished value of these resources.

3. ECONOMIC APPROACH TO ASSESSING REGIONAL BENEFITS

Regional benefits result when decisions or activities increase the incomes received by individuals and firms within the region of interest. In effect, the same economic principles are applied as for national benefits, but they are applied to the incomes within the region. Some forms of regional benefits are a portion of the national benefit. Some regional benefits are offset by losses in other regions of the nation. Inter-regional benefits and costs may fully offset each other, producing no net national benefit. If for example, the total reduction in harvest from the no-action alternative would result in an equal increase in harvest in southeastern United States at the same cost, then there would be no national benefit to the sales.

Federal timber receipts are shared with States and counties in accordance with formulae specified in Federal law. This sharing determines the distribution of the benefits, but it does not alter the nature or extent of the national benefits. Thus, the region shares benefits from the harvesting of timber even though the landowner is the Federal Government. The regional benefit from the proposed sales is the difference between the revenues the region would receive from the Federal Government's timber sales with the proposed actions and the region's receipts without the proposed actions. The extent of this difference is reduced by "safety net" provisions of Federal law that reduce the extent to which the region's receipts vary with changes in Federal timber receipts.

Most of the income earned by workers in the timber industry and much of the income earned by owners of capital equipment used in harvesting, transporting, and processing timber accrue to individuals and firms within the region. Thus, essentially all of the additional wage and salary income that would arise from harvesting the 44 tracts (over and above the income without the 44 sales) is a valid regional benefit. The state and local taxes on these additional incomes are not an additional benefit; they are merely a transfer from the individuals who earned the income to a unit of government.

The potential for a private timber supply response may offset this type of regional benefit. A timber supply response in the region would reduce the contraction of the timber industry that would result if the proposed sales do not occur. In the hypothetical case in which all of the timber to be harvested from the 44 tracts would be replaced from other sources within the region, the income earned in the timber industry regionally would not be affected by implementing the proposed actions. Thus, the greater the timber response within the region, the less the proposed sales would create income in the harvesting and milling of timber beyond that which would occur without the 44 sales.

Transfer payments from the Federal Government to the region for unemployment programs would also offset the regional benefit from the additional incomes that would be earned as a result of the proposed sales. Income maintenance programs or job training programs that create employment would tend to increase the levels of income within the region if the proposed sales do not occur, as compared to the income levels without such programs. Because of such higher income levels, the difference between income within the region with the proposed actions and income without the proposed actions would be less.

Most of the sociological benefits of the proposed sales occur within communities in the region and are thus valid regional as well as national economic benefits. However, a timber response will increase employment and result in avoided sociological effects. These are treated as a benefit of the timber response and serve to offset any increased effects in western Oregon due to the proposed actions.

4. ECONOMIC APPROACH TO ASSESSING REGIONAL COSTS

Regional costs, like regional benefits, are those portions of the national costs which occur within the region as a result of the proposed actions. There is not a fixed definition of region, and the definition used may vary from situation to situation. The geographic definition of the relevant region plays an important role in defining the relative importance of regional effects. For example, the relative effect of the loss or gain of a given number of jobs, or particular environmental costs and benefits, will be greater in a small region and lesser in a large region, everything else being equal. Similarly, the magnitude of existence values can be affected by the size of the region. The larger the region chosen, the larger the existence value, because the preferences of a greater number of individuals are being taken into account. However, factors other than geographical size may be important in defining what constitutes a region.

SECTION 2: ESTIMATING THE BENEFITS AND COSTS

ESTIMATED MAGNITUDE OF MARKET-RELATED BENEFITS AND COSTS OF THE PROPOSED ACTIONS

This section examines the evidence regarding the extent of market-related benefits and costs (both nationally and regionally) of harvesting the 44 timber tracts. The previous section serves as the foundation for this examination, by summarizing the conceptual approach to evaluating the economic benefits and costs. The magnitude of the estimated benefits and costs of the proposed actions are shown in Table 2.3, Summary of Valid Economic Benefits and Costs of the Proposed Actions. The estimates contained in this table are described in detail in this section. Additional information on how these calculations were performed can be found in Appendix 3, "Explanation for Calculations in Tables 2.3 and 3.1."

The definition of region used in estimating regional benefits and costs is the Westside of Oregon. It was chosen because it was the smallest area for which reliable information on employment multipliers and supply responses were available in the record. See discussion below on job multipliers. Given that harvesting and milling may occur in different counties, that the receipts from the sales will flow to all of the O&C counties rather than just the six counties in which sales occur, and that many consumer level expenditures have effects that cross county or state boundaries, use of this definition overestimates regional effects compared to a definition of region encompassing a larger geographic area.

This definition of region is smaller than the definition of region asserted by Richard Haynes, W. Edward Whitelaw, and Bureau of Land Management rebuttal witness John Mitchell [Affidavits of Fish and Wildlife Service witnesses Richard Haynes, page 3; W. Edward Whitelaw, pages 11-12; and Bureau of Land Management rebuttal witness John Mitchell, transcript, pages 3566], but larger than that asserted by O&C witness Robert Lee and Paul Ehinger [rebuttal testimony of Robert Lee, page 5; Testimony of Paul Ehinger, a Northwest Forest Resources Council, transcript, page 1586]. Richard Haynes, W. Ed Whitelaw, and John Mitchell asserted that the relevant region was the region west of the Cascades in Washington, Oregon, and California. The testimony of Robert Lee and Paul Ehinger implies that the relevant region is the county or community. In assessing the economic effects of changing timber availability in Oregon, BLM Exhibit 189, page 31, divides Western Oregon into eight regions, one or more counties each.

For the purposes of the analysis developed in this chapter, the region chosen was Oregon west of the Cascades. However, Chapter 4 summarizes and examines information in the record regarding the concept of region from the perspective of the counties in which the sales occur.

Table 2.3. Estimated Magnitude of Valid Economic Costs and Benefits

Timber Production Benefits

National	Western Oregon
Total Stumpage Value: $58-64 million. Maximum $10 million offset from alternative courses of action.	**Share of Federal Timber Receipts**: $0-64 million with safety net; $29-32 million if no safety net.
Silvicultural Benefit: $0.016-2 million.	**Share of Future Federal Timber Receipts From Same Tracts**: $0.008-$1 million.
Avoided Timber Supply Response Costs: Approximately $0.	**Portion of Avoided Timber Supply Response Costs**: Approximately $0.

Employment Benefits

National	Western Oregon
Higher Wages: National benefit less than regional. Market adjustments could offset maximum of $10.7 million.	**Higher Wages Within the Region**: Range is $11.9-18.8 million. Maximum of $4.1 million could be offset by alternative courses of action. In addition, income support programs are likely to offset some of the benefits.

Sociological Benefits

National	Western Oregon
Desirable Effects on Individuals, Families, and Communities Nationwide: National benefit less than regional. Market adjustments produce offsetting gains. Potential significant reduction.	**Desirable Effects on Individuals, Families, and Communities Within the Region**: Unpriced. Record indicates adverse effect from cumulative timber withdrawals. Record silent on effect of 44 sales. Market adjustments offset employment and sociological effects.

Table 2.3. Estimated Magnitude of Valid Economic Costs and Benefits (Continued)

Costs of the Proposed Actions

National	Western Oregon
Recreation Costs Nationwide: Smaller than regional.	**Recreation Costs Within the Region**: Small.
Decreased Existence Values Experienced Nationwide: Unpriced. Record indicates adverse effects from cumulative withdrawals. Record silent on effect of 44 sales.	**Decreased Existence Values Experienced Within the Region**: Smaller than national.
Other Environmental Costs: Unpriced. Avoided adverse environmental effects in other timber producing regions reduce costs.	**Other Environmental Costs Within the Region**: Unpriced. Record indicates adverse effects from timbering generally and potential effects from the 44 sales.

1. TIMBER PRODUCTION

Stumpage Value of the 44 Tracts

The primary benefit of the 44 timber sales is the stumpage value of the 44 tracts. The Bureau of Land Management estimates the total stumpage value of the timber on the 44 sales to be $69,165,484. The contribution of each of the individual 44 sales is shown in Table 4.10 in Chapter 4.

Variation in Stumpage Value. The average price for the 219 MMBF (short-log scale) is $316/MBF (the weighted average of the 44 individual sale appraised values), but the stumpage value of the individual tracts varies quite widely. [BLM Exhibits 1 through 44] Among the factors which are likely to influence stumpage value are the location of the tract (remote tracts require more logging roads and more hauling cost to the mills), the nature of the terrain (which affects the timbering costs), and the quality of the wood. Older trees often have better quality wood, but the value of these stands is not well correlated with the age class of the trees. The Bureau of Land Management's estimated value for each tract is the minimum bid that the Bureau will accept.

Inflated Stumpage Prices. Stumpage prices have risen rapidly on the Westside in the last few years, raising questions about which price it is appropriate to use in conducting an analysis of economic benefits.

Some of the increase in stumpage reflects mill owners' efforts to maintain sufficient feedstock to conduct at least a minimal level of operation, retain their work force, and stay in business. In their efforts to maintain some inventory of logs, they are drawing down capital and bidding up stumpage prices. [Affidavits of Northwest Forest Resource Council witnesses William G. Frohnmayer, pages 9-10; Everett P. Johnson, page 8] Mill owners cannot pass the inflated portion of the stumpage prices on to buyers of lumber. The market for logs is local and regional, but the lumber market is a national market, and competition will substantially prevent the pass-through. Further, only that portion of the stumpage value that can be passed on measures the economic benefits of the timber. The residual above the portion of the stumpage that can be passed on to purchasers of lumber is a transfer of wealth from mill owners to timber growers: the mill owners' losses are offset by the timber growers' profits.

The inflated value of Westside stumpage could have presented difficulties with respect to the Endangered Species Committee's efforts to evaluate the benefits of the proposed actions. Fortunately, the Bureau of Land Management's procedure for estimating stumpage prices is market driven, i.e., it is derived from lumber prices. Thus, the Bureau of Land Management's appraised values may be accepted as estimates of economic benefits.

Present Value of the Stumpage. For purpose of the benefit-cost analysis and the estimation of regional and national effects, all values must be expressed in present value terms. (See "Accumulating Costs Over Time" in Appendix 1.) In order for the present value of the 44 tracts to be $69.2 million either the tracts would all have to be harvested immediately after they were sold, or the winning bidders would have to pay for the timber at the time of sale rather than at harvest time. Bureau of Land Management contracts call for tracts to be harvested within three years of the sale. Payments are made as the timber is harvested, although the contracts contain provisions for periodic diligence payments, as well. On average, the harvesting pattern for Bureau of Land Management tracts is 10 percent during the first year after sale, 60 percent in the second year, and 30 percent in the last year. [Affidavit of William Bradley, p. 14] Assuming that this would be the pattern for the 44 tracts, the present value of the stumpage is $57.9 million, discounted at 8.5 percent, and $63.5 million, discounted at four percent.

Regional Value of the Stumpage. Among the criteria which the Committee needs to consider in making an exemption decision is whether the benefits of a proposed action are of regional or national significance. The regional benefits constitute a portion of the $57.9 to $63.3 million of national benefits.

The receipts from Bureau of Land Management timber sales are shared by residents of the Oregon timber counties and U.S. taxpayers in general. The cost-sharing formula is a function of the type (the legal classification) of the land to be harvested. The timber from the 44 sales is located largely on O&C land (87 percent), but a small percentage is on Coos Bay Wagon Road Lands (6 percent) and Public Domain Lands (7 percent). The share of the revenue accruing to the region from the proposed harvesting on Coos Bay Wagon Road Lands and Public Domain Lands is small. Consequently, the rest of the discussion of the regional share of the stumpage focusses on the O&C lands. For a complete discussion of the timber revenue sharing formulas and sources of information see Chapter 4. Also see Chapter 4, Figure 4.1, "Revenues Received by O&C Counties, 1970-1991".

From 1960 to 1990, the Federal Treasury and the O&C counties shared the gross timber revenues from the Bureau of Land Management lands equally. Since 1953, the O&C counties have been eligible to receive 75 percent of the gross revenues from O&C lands. However, since 1960, the counties have received only 50 percent, with the other 25 percent used for administration of the O&C lands. If this were still the case, the stumpage revenue from the proposed sales on the O&C lands would be distributed equally between taxpayers in general and residents of the O&C counties. However, starting in 1990, Congress placed a floor, or "safety net," under the O&C share, insulating the counties from much of the revenue losses due to reduced Federal timber sales. For FY 1991, the counties were guaranteed 90 percent of the average revenue which they received during the last three years, and for FY 1992, the counties are guaranteed 90 percent of the average for the previous five years. However, the counties are not guaranteed more than the total O&C timber sales revenues for 1991 and 1992, respectively. If the sales revenues fall so much that they are less than the calculated guarantee, then the counties receive all the revenues. County receipts in 1991 with the safety net were $96.6 million. Without the safety net receipts would have been $69.9 million. [BLM Exhibit 59] See Chapter 4, Figure 4.1.

If any of the 44 sales are harvested while the safety net is in effect, this can have a significant impact on the O&C counties' potential share of the stumpage revenues from the 44 sale tracts. If so little harvesting was done on O&C lands that the 44 tracts were the only source of O&C timber revenues, then all of the revenues would accrue to the counties, because total timber sale revenues would be less than the guarantee. Similarly, if the guarantee had been attained just prior to the harvesting of the 44 tracts, none of the revenues from the 44 tracts would accrue to the O&C counties. They would all go to the Federal Treasury.

2. MAGNITUDE OF THE PRICE-INDUCED EFFECTS

Earlier in this chapter the avoidance of increased harvesting costs associated with the timber response (the increased supply of timber by private growers) was identified as one of the valid national benefits of the proposed timber sales. In order to estimate the magnitude of these avoided costs, one has to know the effect that the 44 sales would have on the market price of timber and lumber and the size of the avoided timber response. The evidence introduced into the record on these topics is summarized below. Although witnesses differed widely regarding the potential size of the timber response, they did agree that the 44 sales would have an imperceptible effect on the market price of timber. Thus the small change in the market price of timber means that the avoided timber supply response costs are negligible, and these costs can effectively be ignored in estimating the benefits of harvesting the 44 tracts.

Percentage of the Market

The hearing record is consistent regarding the percentage of the market for timber comprised by the 44 sales: two percent of the harvest on the Westside of the Cascades (the Douglas fir region); 0.6 percent of the national harvest of softwood; and 0.13 percent of the timber harvest worldwide. [Affidavit of Richard Haynes, a Fish and Wildlife Service witness, page 3; Affidavit of Bruce Lippke, a Bureau of Land Management witness, page 5 and 7; Con Schallau, a Bureau of Land Management witness, transcript, pages 708 and 719; Affidavit of W. Edward Whitelaw, page 15] Although the 44 sales comprise only a small share of the market, they could still represent a significant amount of economic activity for the timber-dependent communities over the period in which harvest would occur.

Effect of the 44 Sales on Market Price

The volume of timber from these sales is too small to have a major effect on the price of lumber nationally and at most only a small effect on the regional price of timber and lumber. Bruce Lippke estimated that a withdrawal of 200 MMBF would result in a sustainable price rise of only $1.96/MBF or 0.6 percent. [Affidavit of Bruce Lippke, a Bureau of Land Management witness, page 5.]

Elasticity of Supply and the Timber Response

The record contains a wide range of opinions regarding potential alternative sources of supply to the 44 tracts. At one end of the spectrum it was argued that supply is already so constrained by withdrawals, litigation, and regulations that there are virtually no alternative sources of timber. [Affidavit of Con Schallau, a Bureau of Land Management witness, pages 12-14; Affidavit of David Cox, an O&C witness, pages 7-10; Affidavit of Paul Ehinger, a Northwest Forest Resources Council witness, pages 2-8] At the other extreme it was contended that due to the recession and the precipitous decline in housing starts, the timber market is characterized by a lack of demand, rather than a tight supply. [Affidavit of W. Edward Whitelaw, a Fish and Wildlife Service witness, page 9]

Richard Haynes, a Fish and Wildlife Service witness, testified that in response to higher prices, logs would be diverted from the export market, and private timber harvests would be accelerated, offsetting 75 percent of the loss from the 44 tracts. [Affidavit of Richard Haynes, page 3, and rebuttal affidavit, page 2] Bruce Lippke, a Bureau of Land Management witness, estimated that given sufficient time (3-5 years), the market would offset 90 percent of the withdrawal from the 44 tracts: 24 percent of the offset from additional harvests on the Westside, 27 percent through increased harvests by other domestic sources, and 49 percent from imports. [Affidavit of Bruce Lippke, pages 5 and 9] However, Bruce Lippke cautioned that depending upon the extent to which private suppliers are constrained by conservation requirements for the spotted owl, the Westside response could be as little as three percent.

Paul Ehinger, a Northwest Forest Resources Council witness, asserted that

> *There is little possibility of increased harvest from other sources. All public sources throughout Oregon are committed to domestic processing and none have any new opportunities to provide logs for Western Oregon mills.* [Affidavit of Paul Ehinger, page 6]

David Cox, an O&C Counties witness, supported Paul Ehinger's testimony noting,

> *There is evidence that leads to the conclusion there is limited opportunity for private timber harvest to offset declines in the Bureau of Land Management timber harvests . . . At the current time, there are major log supply shortages, and numerous mills have either temporarily curtailed production or closed because of log shortages.* [Affidavit of David Cox, page 7]

Richard Haynes testified that:

> *Offering these sales now rather than next year would have little effect on the national and regional timber supply picture, given the depressed demand for lumber and wood products. . . . Even if these sales were permanently deferred the impact would be slight; other sources of timber supply would respond to a permanent withdrawal of the 224 million board feet and reduce the net harvest reduction to 55 million board feet.* [Affidavit of Richard Haynes, page 3]

The testimony in the record is conflicting because of the range of scenarios and because distinctions were not always drawn between short- and long-run responses, between timber and lumber markets, and among local, regional, national, and international markets and responses.

3. SILVICULTURAL BENEFITS

Because timber is a renewable resource, the timber benefits that flow from a particular piece of forestland are the value of the current harvest plus the present value of all future harvests. The net present value of the stream of future harvests depends on the discount rate, the length of the rotation, the stream of management costs, and the stumpage price.

Bureau of Land Management witnesses maintained that the principal silvicultural benefit of harvesting the 44 tracts is replacing older stands of timber with younger, faster growing, stands. [Affidavits of David Mason, James Rubado, Gordon Orloff, Phillip Redlinger, Kirk Casavan, Michael Creswell, Jeffrey Davis, Frank Price, David Sherman, and Peter Kirk] Other silvicultural benefits of harvesting the tracts are: opportunity to alter the composition of forest species; achievement of greater timber density per acre; addition of disease-resistant species (e.g., rust-resistant Sugar Pine); and removal of diseased stands.

Table 2.4

Present Worth of Three Future Timber Harvests
($ millions 1991)

Interest Rate	Gross	Net
4.0%	$2.86	$2.002
8.5%	$0.088	$0.062

Once converted to a managed forest the trees continue to mature until harvested. According to McArdle et al., high site III, fully stocked, Douglas-fir stands yield 54.3 MBF/acre at age 80. [BLM Exhibit 205, p. 27] Sessions et al. suggest an average stocking rate of 85 percent is appropriate here. [BLM Exhibit 188, p. 37] Thus, a yield of 46.2 MBF/acre [=.85(54.3)] was used for the analysis that follows.

No witness estimated the net present value of the stream of future harvests. Based on data introduced into the record, the following assumptions were made in order to develop estimates of the present value of future harvests: an 80-year rotation; average timber density of 46.2 MBF per acre for the 4,448 acres; a stumpage price of $316/MBF; a harvesting pattern of 10/60/30; and replanting in the year of harvest. Timber withdrawals and economic growth could force stumpage prices above $316/MBF. However, the wood in 80-year stands may not be as valuable as that in old-growth forests. Janet Baker, a Bureau of Land Management witness, testified that the Forest Service's operating costs were approximately 30 percent of revenue in the Washington/Oregon area in 1990. [Rebuttal Affidavit of Janet Baker, page 7] This figure was assumed for timber management costs and subtracted from the gross revenue figure (in the year the revenue was realized) to yield net revenue.

Table 2.4 contains estimated present values for future harvests, assuming that the 44 tracts are dedicated to timbering on an 80-year rotation. Column two gives gross benefits, and does not take into account timber management costs. Column three includes an estimate of the costs of managing the timber.

4. EMPLOYMENT AND ASSET VALUE EFFECTS

The Present Value of Wage and Income Effects

Given the state of the economy and the characteristics of the Oregon communities and counties that would be directly affected by the 44 sales, it is very likely that if the 44 sales did not occur, there would be an adjustment period during which some people would be unemployed and lose their incomes. (See Chapter 4 for a description of the economies of the six sale counties and a discussion about displaced workers.) These income effects must be taken into account in estimating the national and regional benefits of the 44 sales. There are two steps involved: 1) estimating the gains in employment (direct, indirect, and induced) that would result from the 44 sales, and 2) determining the wage rate to use to evaluate those gains in employment.

Job Multipliers. "Job multipliers" are used to estimate the employment effects associated with a particular level of economic activity (in this case, harvesting 44 timber tracts). For the purposes of estimating employment effects of changes in timber supply, direct employment is defined as that in the timber and wood processing industries, indirect employment is that in the industries that supply goods and services to the timber and wood products industries and induced employment is that in the rest of the economy that results from the spending by direct and indirect workers.

A number of witnesses testified regarding employment multipliers. The estimates ranged from 9.3-15.1 man-years of labor associated with the harvest of each MMBF of timber. [Affidavit of David Cox, an O&C witness, pages 12-13; Affidavit of W. Edward Whitelaw, a Fish and Wildlife Service witness, pages 4; Affidavit of Richard Haynes, a Fish and Wildlife Service witness, page 4; Affidavit of William McKillop, a Bureau of Land Management witness, page 8] The range of estimates is magnified by a difference in the two conventions for measuring stumpage volumes.

There are two methods for measuring stumpage volume: the long-log scale and short-log scale. The two methods produce board-foot indices which differ by 15-20 percent. Since the amount of economic activity and employment which emanates from a log is independent of the method used to estimate the volume of board feet, employment multipliers are designed to compensate for the differences between the two measurement techniques, and hence are long-log-scale and short-log-scale specific. The Bureau of Land Management uses the short-log scale to estimate stumpage volumes. In their testimony, some witnesses introduced long-log scale employment multipliers (generally based on Bureau of Land Management Exhibit 188 [Sessions et al., Timber for Oregon's Tomorrow: The 1989 Update, 1990]), while other witnesses introduced short-log employment multipliers. When the employment multipliers introduced by the above mentioned witnesses are converted to the long-log scale, the range of estimates is reduced to 11.5-15.1.

For the calculations in this report, the mid-range multipliers introduced by David Cox (Cox, affidavit, pp. 12-13) were chosen from among the estimates in the record. For each million board feet of timber harvested, it was assumed that 13.5 man-years of labor are used in Western Oregon and of these, 5.7 are jobs directly associated with the forest and wood products industries and 7.8 are jobs in other industries. These are long-log multipliers, and as indicated above, the Bureau of Land Management measures stumpage with the short-log scale. Thus, for calculating employment effects a conversion factor of .81 was applied to the stumpage volumes reported by the Bureau of Land Management. The source for the conversion factor is Bureau of Land Management Exhibit 199 [The Oregon State Forestry Department, Oregon Timber Harvest Report, 1990].

Some Caveats about Job Multipliers. Generally, employment multipliers account for employment within a county or region, and do not account for employment which occurs in markets throughout the nation as a result of the changes within that county or region.

The changes induced nationally can be both complementary to and opposite to the regional changes.

With rare exception, employment multipliers account exclusively for private sector effects. Thus, in Oregon these multipliers do not include any public employment effects that might be associated with changes in revenue to the O&C counties or the Bureau of Land Management.

Although the record has some limited data on income maintenance and reemployment programs, using these data to make adjustments in the estimates of regional and county effects would involve considerable speculation. Suffice it to say that these programs involve transfer payments from taxpayers in Oregon and from U.S. taxpayers generally to displaced workers in Oregon, and that the payments will be concentrated in the counties in which the 44 sales are to occur. Assessing the difference between employment levels with the proposed sales and those without the sales is complicated by the effects of income maintenance and retraining programs. Displaced workers who receive unemployment insurance or other income maintenance assistance will not reduce their expenditures for goods and services as much as they would have in the absence of such assistance. As a result, those who produce these goods and services will not experience as much unemployment either. Also, increases in income and employment for those providing retraining and reemployment services are additions to county income, and serve to offset some of the income and expenditure reductions of displaced workers. Employment multipliers do not account for these effects.

The first 26 weeks of unemployment benefits are financed by State taxes on employers. The Federal Government has extended the benefits to 39 weeks, with the 13 week extension financed from Federal revenues. The average weekly benefit in Oregon in 1990 was $162. There are income assistance programs other than unemployment insurance, and some displaced workers in Oregon may become eligible for them.

If the program costs are born largely by Oregon citizens, one might conclude that the regionwide effects would be limited. However, the taxes on Oregon citizens to finance income maintenance payments are statutorily set and unaffected by the decision on the 44 sales.

Employment multipliers are derived from historic statistics and are estimates of the total number of direct, indirect, and induced jobs associated with a specified level of economic activity. They do not provide information about the timing and duration of unemployment should the sales not occur. The timing of the job losses depends on the harvesting pattern that would have been used as well as local and regional economic conditions. Although employment multipliers are estimates, they are not normally presented with their associated statistical confidence intervals. That was the case as well for the evidence introduced into the hearing record.

In discussing multipliers, each economic witness presented only one value for an employment multiplier. These multipliers were averages for the entire region, however. County multipliers differ depending on the degree of economic diversification and development within the county. Larger multipliers generally mean greater degrees of diversification and development. However, larger multipliers do not necessarily mean a greater economic impact. Indeed, the reverse may be so. The larger the multiplier is, the more opportunities for reemployment because of the greater degree of development and diversification in the county. Although larger multipliers generally imply greater diversification, it is possible for a larger multiplier to result from a concentration of timber processing facilities rather than a diversification of an area's economy.

Calculating the Income Effects. The employment benefits associated with harvesting the 44 tracts are derived by comparing the operation of the economy with the proposed actions and the operation of the economy without them. If the 44 sales are held, employment effects (direct, indirect, and induced) will ensue. For purposes of the income and employment effects associated with harvesting the tracts, it was assumed that all workers (direct, indirect, and induced) are drawn from the ranks of the unemployed. If the workers are drawn from other occupations, then harvesting the 44 tracts will not add to employment. Harvesting the tracts will only substitute one form of employment for another, and there will be no net employment benefits.

In the "with-sales" case, all workers (direct, indirect, and induced) were assumed to become employed in a pattern consistent with the pattern in which tracts sold by the Bureau of Land Management are normally harvested. Given the historic harvesting pattern noted above, the expected pattern of hiring would be 10 percent of the workers in year one, 60 percent in year two, and 30 percent in year three. It was assumed that once the 44 tracts are harvested, the workers again become unemployed.

If the sales are not held, the people who would have been employed in the "with-sales" case will remain unemployed, but not indefinitely. For purposes of comparison, four different reemployment rates were used, together with two different reemployment wage differentials. The same reemployment patterns were assumed to apply in the "with-sales" case once the tracts were harvested.

Five years of differences between the with-sales and without-sales streams of wage payments were discounted to obtain the present value of the wage benefits associated with harvesting the tracts. The cumulative results for all 44 sales appear in Table 2.5. A fuller explanation of how the calculations were conducted is provided in the next section. Also, in Chapter 4, the section entitled "Evidence Concerning Employment" summarizes the results of surveys of displaced workers, discusses the implications of the survey findings for those affected by the 44 sales, and examines their reemployment prospects.

The results are most sensitive to the assumption about the reemployment wage differential. Because of the range of possible assumptions and the differences between regional and national effects, interpreting the table requires some care. Several scenarios are discussed below.

Regional Employment Effects

This section uses data from the record to estimate regional income benefits. The entries in Table 2.5, columns 4-7 are the estimated present values of the regional income gains from harvesting the 44 tracts, based on the following assumptions:

o For the purposes of this analysis, region is assumed to be the Westside of Oregon. This definition was chosen because it was the minimum area for which employment multipliers were available. Applying employment multipliers to small areas does not capture the cross-county employment effects that are associated with harvesting and processing timber as well as the effects of consumer purchases that occur over a broader area. Using a definition which encompassed a larger area (e.g., west of the Cascades in Washington, Oregon, and California) would reduce the regional effects. Use of a smaller region (should reliable employment multipliers be available) would result in greater effects.

o 13.5 workers are employed in Western Oregon for each million board feet (MMBF) of timber harvested (long-log scale).

o The calculations assume that all of the 13.5 per MMBF (long-log scale) workers associated with harvesting the 44 tracts are drawn from the ranks of the unemployed. It is assumed that the 13.5 workers per MMBF (long-log scale) would have been unemployed had the tracts not been harvested. Under these circumstances, wage gains associated with harvesting the 44 tracts count as a benefit. This treatment is consistent with criteria established in the standard reference, the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies issued by the Water Resources Council. The table overestimates wage gains to the extent that workers were not previously unemployed and would not have been unemployed during the duration of the harvesting of the 44 tracts.

o The 44 tracts involve 219 MMBF (short-log scale) which would be harvested according to the 10/60/30 pattern discussed above. Timber volumes were converted to long-log scale.

- For purposes of comparison, four different reemployment rates were used. Initially, 92 percent of unemployed workers were assumed to be reemployed after six months of unemployment. The remaining 8 percent were assumed to find new employment one year later. This 92/8 pattern of reemployment is based on findings of Bureau of Labor Statistics surveys of displaced workers. Bureau of Labor Statistics surveys indicate that 92 percent of displaced workers find new jobs within a year of being laid off. For the second comparative analysis, 92 percent of unemployed workers were assumed to be reemployed at the end of the first year of unemployment, with the remaining 8 percent assumed to find new employment at the end of the second year. In the other two analyses, reemployment rates of 80/20 and 70/30 were used.

- Workers experience wage reductions at reemployment of either 20 percent (upper half of Table 2.5) or 30 percent (lower half), and the lower wages persist for 5 years. The record indicates that programs serving displaced workers in Oregon found that on reemployment workers experienced average reductions in wages ranging from 20 to 30 percent.

  The calculations were made assuming that all workers (timber and non-timber) incurred a permanent wage reduction for a full five-year period. This assumption may overestimate the extent of wage losses. While displaced timber workers are likely to suffer the greatest proportionate wage losses, the wage losses of other workers (especially in counties that have more diversified economies, and especially for skilled workers) will be subject to greater variation. Some non-timber workers will end up with higher post-displacement wages, some with comparable wages, and some with lower wages. The Bureau of Labor Statistics' January, 1990 survey of displaced workers found that among all displaced workers, about 57 percent reported post-displacement wages equal to or above their previous wages. Among manufacturing workers, about 30 percent reported wages 20 percent or more below their previous earnings, while 26 percent reported wages 20 percent or more above their previous wages (Bureau of Labor Statistics Bulletin 2382, June, 1991, page 6).

  The assumption that wage differentials last five years is also based on findings of Bureau of Labor Statistics surveys of displaced workers. Bureau of Labor Statistics surveys indicate that it takes workers five years to return to their pre-displacement wage rate. Individuals are likely to recover wages gradually over time, however, with some wage increases occurring yearly. Thus, rather than enduring a proportionate wage loss over the entire five-year period, workers are likely to experience a somewhat gradual recovery of wage losses. If we had assumed a gradual recovery in wage rates, the estimates of the present value of income losses would have been smaller.

- Present values are estimated at two different discount rates: four percent and 8.5 percent. The current rate specified by the Office of Management and Budget for use in calculating benefits from Federal water resource projects is 8.5 percent. Four percent is probably closer to the real rate of return on capital, and is the rate reflected in the record.

The estimates of the present value of the gains in regional income due to harvesting the 44 tracts range from $11.9 to $18.8 million. Columns 6 and 7 in Table 2.5 utilize more pessimistic assumptions about reemployment prospects than columns 4 and 5: 80 percent reemployment at the end of the first year in column 6; 70 percent in column 7. The entries in Table 2.5 reflect an employment multiplier of 13.5/MMBF. If the multiplier introduced by Richard Haynes had been used, the entries in Table 2.5 would be 15 percent lower. If William McKillop's multiplier had been used, the entries would be 12 percent higher.

The entries in Table 2.5 reflect an assumed harvesting pattern of 10/60/30. If the tracts were harvested in one year, the range of values in Table 2.5 would be $11.3 to $20.7 million.

Table 2.5

Income Benefits, in Millions of Dollars
10/60/30 Harvest Pattern

			Present Value of Wages by Reemployment Pattern[1] ($millions)			
Wage Reduction	Discount Rate (Percent)	Duration of Cut (years)	Mid-Year 92%/8%	Year End 92%/8%	Year End 80%/20%	Year End 70%/30%
20%	8.5	5	$12.2	$13.6	$13.9	$14.2
20%	4.0	5	11.9	12.2	12.6	12.8
30%	8.5	5	16.7	18.2	18.5	18.8
30%	4.0	5	16.8	17.6	17.7	17.9

[1] Year-end reemployment patterns indicate percentage reemployed at the end of the first year and percentage reemployed at the end of the second year. Mid-year reemployment pattern indicates percentage reemployed by mid-year during the first year following displacement, and the percentage reemployed by mid-year of the second year following displacement.

The evidence in the record is not definitive regarding any of these estimates. If one believes that the economy is recovering, then the estimates of income effects in columns 4 and 5 may be too high. Similarly, these estimates may be too high if Richard Haynes is correct that the injunction on many Forest Service tracts is likely to be vacated soon and a significant volume of tracts will be offered this spring, i.e., 1992. Alternatively, if one believes that the recession is worsening and will be prolonged or that Forest Service tracts will not be offered soon, then the estimates in columns 6 and 7 may be more likely.

Although numerous witnesses addressed the employment effects from harvesting the 44 sales, only two witnesses provided estimates of the income gains from harvesting the tracts. William McKillop, a Bureau of Land Management witness, testified that "the 44 sales...would generate $40 million in payrolls in the timber industry and $63 million in total payrolls for the economy as a whole". [Affidavit of William McKillop, page 8] William McKillop did not explain in detail how he derived his estimates. They are 3-4 times larger than those in Table 2.5.

Based on average annual forest industry wages of about $29,300 and service and trade wages of about $19,900, David Cox testified that "the payroll for the direct, indirect and induced jobs generated by harvesting the 44 timber sales would be approximately $56,500,000 annually." [Affidavit of David Cox, page 13] In order for the 44 timber sales to generate $56.5 million annually, the tracts would all have to be harvested in one year; the employment would have to continue after the tracts were harvested; and in the absence of the 44 sales, the unemployed workers would have to have no reemployment opportunities.

Table 2.5 provides estimated income benefits from harvesting all 44 tracts. In Chapter 4, Tables 4.8 and 4.9 provide estimates of the county-level employment effects associated with the 44 sales. Also, Table 4.10 provides the gross employment effects (no consideration of reemployment prospects) on a tract by tract basis.

The magnitude of the price-induced timber response can have a substantial effect on regional wage and income effects. Bruce Lippke, a Bureau of Land Management witness, testified that if the 44 sales were not held, Westside (Washington, Oregon, and California) producers could offset as much as 24 percent of the withdrawn timber, and Richard Haynes, a Fish and Wildlife Service witness, testified that the timber response together with export diversions could amount to 75 percent of the timber withdrawal. [Affidavit of Bruce Lippke, page 9; Affidavit of Richard Haynes, page 3] In the short-run, such responses would reduce the values in Table 2.5 by comparable amounts. If, as is likely, the timber responses could not be sustained because of the lack of harvestable timber, then the income and employment gains reflected in Table 2.5 would be offset less than the numbers presented by Bruce Lippke or Richard Haynes suggest.

National Employment Effects

Neither the six sale counties nor the Westside of Oregon is a closed economy. They purchase goods and services that are made nationally and internationally. The record does not contain any evidence on the magnitude of the income and employment effects beyond Oregon's borders. Because these effects are so widely dispersed, they are likely to be less apparent than those in the timber dependent communities of Oregon. Further, because the national economy is diversified with greater opportunities for reemployment than in the six counties in which the 44 sales would occur, any reductions in employment and income are likely to be less prolonged and to dissipate more quickly.

At the national level, a private timber response from other regions of the country would offset some of the unemployment in Oregon that would occur if the 44 sales were not held. Bruce Lippke estimated that 24 percent [=.27(.9)] of the timber losses could be offset in the short-run by other timber producing regions of the U.S. (See Appendix 3, section on "Timber Response" for explanation.) If this private timber response results in employment gains similar to those from the proposed actions, the national gain from the 44 sales would be reduced. A private timber response from other timber producing regions of the U.S. equal to 24 percent of the losses from the 44 sales in conjunction with Bruce Lippke's estimate of the potential Westside timber response (22 percent) would cut the income loss estimates in Table 2.5 almost in half (0.22 + 0.24 = 0.46).

Finally, some unemployed workers in Oregon will migrate to jobs outside Western Oregon. Their incomes in their new jobs offset the loss of income from their previous jobs, thus reducing national income effects. From the point of view of Oregon, there has been a reduction in the State's income, but from the point of view of the workers and the nation, there is no change: Oregon's reduction in income due to the migration of jobs is fully offset by the gains in other regions. This is true if the migrating workers locate new jobs quickly at comparable wage rates. Any delay in locating employment, or reduction in wages, results in regional costs in Oregon which are also national costs.

Asset Values

If the proposed sales are not held, some assets (mills) decline in value while others (timberland) increase. In effect, timberland owners benefit at the expense of the mills that pay higher prices for timber. The gains to forestland owners are offset by the losses to mill owners. Thus, there are no benefits (national or regional), only transfers between the two groups.

This is not to say that some owners of mills and other capital assets will not suffer reductions in wealth. In particular, the value of milling, harvesting, and other capital equipment used in activities related to the 44 sales may be reduced as a result of lower utilization rates or because the assets are no longer needed. Mill closures attributable to the 44 sales would be a reduction in regional timber processing capacity. If it has no other uses, this capital may have only salvage value.

Several witnesses indicated that a reduced harvest would cause additional idle time, leading to mills being used at less than full capacity even if the mills did not actually close down. While some information was presented on mill closure and the losses incurred because of less than capacity operation, there was no specific information on the implications for changes in asset values as related to the effect of the 44 sales.

A model developed by the State of Oregon [BLM Exhibit 220] attempts to quantify a portion of the loss in asset value by measuring the effect of changes in employment, population, average property tax rate, and the Consumer Price Index on the assessed value of property in Douglas County for the 1974-89 period. The model predicts that an employment decrease of 5,278 in Douglas County would result in a decline in assessed values in the County of $205 million. However, sufficient information is not available in the record to indicate the extent to which assessed values are correlated with asset values, the extent to which results can be generalized to other counties, and the extent to which the model will accurately predict assessed values outside of the time period chosen to estimate the model.

ESTIMATED MAGNITUDE OF NON-MARKET BENEFITS AND COSTS OF THE PROPOSED ACTIONS

1. RECREATION

Phillip Meyer, a Fish and Wildlife Service witness, used the unit-day-value method to estimate the lost recreational benefits from harvesting the 44 tracts. He contended that for the regional recreational areas containing the 44 tracts, there is excess demand for primitive and semi-primitive recreational lands (the kinds of lands comprised by the 44 tracts). Using data for comparable Forest Service lands, he adopted a user density of 10 recreational visits per acre per year as supportable by the 44 tracts. He then estimated that these tracts would support $2.0 million of business revenue from recreational trips annually, with a present value of $56.3 million (three percent discount rate). [Affidavit of Phillip Meyer, pages 1-8]

Phillip Meyer's work was strongly criticized in cross-examination. In addition, Robert Ratcliffe, a Bureau of Land Management witness, testified in rebuttal that

> *Meyer's generalized estimates of the level of recreation-base business revenue that the proposed the Bureau of Land Management sale areas would generate is excessive . . . Assumptions about existing recreation use level, user densities, projected growth*

> *in activity demand and average recreationist daily spending are all considerably inflated.* [Robert Ratcliffe, transcript, pages 3115-3153; Rebuttal Affidavit of Robert Ratcliffe, page 15]

On cross-examination it was established that the Mt. Hood National Forest sustains about 10 recreational visits per acre per year and that the facilities and recreational activities on Mt. Hood are far greater than those on the 44 tracts. [Transcript, pages 3120-3126] BLM Exhibits 208-212 identify the recreational activities and facilities in the BLM districts within which the 44 sale tracts are located. These exhibits discuss the resources and provide revenue statistics for the activities within the districts.

Even if Phillip Meyer's figure of $56.3 million were an accurate estimate of the present value of the business revenue supportable by the 44 tracts if they were not harvested, this would not be the present value of the recreational benefits associated with the tracts. $56.3 million is the gross revenue generated, and the returns to all the other resources involved would have to be netted out to determine the amount attributable to the tracts. The resulting estimate would be considerably lower.

2. EXISTENCE, OPTION, AND RECREATIONAL VALUE

Phillip Meyer made other estimates of the reduction in non-market value that would result from harvesting the 44 tracts. These estimates were extrapolated from three other studies: Fish and Wildlife Service Exhibits 49, 50, and 51. These studies use the contingent value method of analysis. Contingent valuation surveys are used to estimate the monetary value of non-market goods and services. Generally, a participant is asked questions designed to determine the amount that he or she is willing to pay for the commodity. There is some controversy among economists concerning the extent to which contingent value surveys accurately measure non-market values.

Of the three contingent valuation studies in the record, Fish and Wildlife Service Exhibit 50 (The Benefits of Preserving Old-Growth Forests and the Northern Spotted Owl, by D. Hagen, J. Vincent, and P. Welle, April 30, 1991) represents the most thorough and recent attempt at evaluating the recreation, option, and existence value of preserving the old-growth forests of the Pacific Northwest. This Exhibit is based on a national mail survey of 1,000 households. Deriving the corresponding values for the 44 tracts based on FWS Exhibit 50 is difficult, because this Exhibit is designed to identify the non-market value of sufficient habitat to support the northern spotted owl, rather than individual tracts or all 44 proposed sale tracts.

Fish and Wildlife Service Exhibit 50 was designed to capture the value that survey respondents placed on the existence of the old-growth forest ecosystem; the option value associated with recreational uses of the forest (the amount one would pay for the right to use the forest in the future); and the option value associated with timbering the forest once more data have been gathered about the resource and its value.

The analysis in Exhibit 50 attempts to control for the biases inherent in the contingent valuation method: the incentive for strategic response; error based on the information conveyed in the questionnaire; and hypothetical bias due to survey participants not having to pay for the benefits. Participants were given a context within which to assess the preservation policy. The survey questions were designed to help the respondent place the conservation policy in the context of nine other policies which compete for limited public funds. Each household was asked to evaluate its "...willingness to pay higher taxes and higher timber-product prices as the 'price' of forest preservation." [FWS Exhibit 50, page 9] Participants were also told that if the Interagency Scientific Committee policy were adopted, they would have to pay higher taxes and higher lumber prices and were presented with an approximate annual cost for their household.

Fish and Wildlife Service Exhibit 50 estimated that the mean value of the amount that households are willing to pay in both increased tax bills and higher wood product prices for a policy that would ban logging on enough forest lands to prevent the extinction of the northern spotted owl ranges from $77.75 to $189.64 annually. [FWS Exhibit 50, pages 22-26] This value applies to all 96 million U.S. households. FWS Exhibit 50 estimates a lower bound of the 95 percent confidence interval on the mean willingness-to-pay as a measure of the non-market benefits. This measure was then reduced by 19 percent to $47.93 to account for the assumption that all nonrespondents place no value on the resource. The statistical evidence in Fish and Wildlife Service Exhibit 50 indicates that with approximately 98 percent confidence, the true mean value of the annual payment households are willing to make to implement the Interagency Scientific Committee strategy is greater than $47.93.

In Fish and Wildlife Service Exhibit 50, estimated benefits were used in conjunction with the results from studies by Lippke and Mead to derive benefit-cost ratios for the nation from implementing the Interagency Scientific Committee strategy. In two independent studies, Lippke and Mead estimated the economic losses to the nation from implementing the Interagency Scientific Committee conservation strategy: $78.3 billion and $32.5 billion respectively. [FWS Exhibit 50, page 7] Again to be conservative, Hagen et al. adjusted Lippke's and Mead's estimates upward to reflect all potential economic losses. Using the lower bound estimate for benefits and the upper bound estimates for costs, Exhibit 50 calculated benefit-cost ratios from implementing the Interagency Scientific Committee strategy: 5.85 (Lippke's costs) and 14.14 (Mead's costs). This means that at a minimum, households would be willing to incur additional costs five times greater than the costs that would actually be incurred by implementing the Interagency Scientific Committee strategy. However, because this Exhibit is designed to identify the value of sufficient habitat to support the northern spotted owl, it is difficult to determine how the results would apply to the 44 proposed sale tracts.

Criticism in the Record

Janet Baker, a Bureau of Land Management witness, criticized the methods used in this study. [Affidavit of Janet Baker, page 8] The issues raised by Janet Baker were: 1) the failure of the survey to explicitly state that "...significant acres of old growth have already been set aside from logging..." and 2) that owl conservation would cost U.S. citizens between $33 and $78 billion..." [Rebuttal Affidavit of Janet Baker, page 8] Mr. Parenteau, Counsel to the Fish and Wildlife Service, objected that Janet Baker was not an expert on contingent valuation, and that it could not be ascertained whether the authors of the two attachments which Janet Baker summarized for her rebuttal had any expertise in contingent valuation methodology. The Administrative Law Judge, while allowing the Rebuttal Affidavit, cautioned the Endangered Species Committee to consider Mr. Parenteau's comments regarding the weight to accord Janet Baker's testimony. [Transcript, pages 4172-4173] Janet Baker was not cross-examined on Attachment 3.

While technically correct, Janet Baker's criticisms do not directly address the methodology used for the survey discussed in Fish and Wildlife Exhibit 50. While survey respondents were not explicitly told the acreage involved, they were informed that old-growth acreage had been set aside in national parks and wilderness areas [FWS Exhibit 50, pages 15-16]. Although survey respondents were not informed of the estimated total costs of implementing the conservation policy, they were told that it could be substantial and how much it would add to their household expenses and taxes [FWS Exhibit 50, page 16].

Implications for the 44 Sales

It is difficult to derive an estimate of the non-market value of the 44 tracts based on the results in Fish and Wildlife Service Exhibit 50. The 44 tracts represent a small, marginal increment to the forest; the analysis in Exhibit 50 is a total, not a marginal analysis. The benefit-cost ratios for these tracts could range from zero upwards. The study provides no basis for valuing the preservation of individual tracts of forestland. It only addresses sufficient area to assure survival of the northern spotted owl.

During cross-examination Fish and Wildlife Service witness Jack Ward Thomas, the chairman of the Interagency Scientific Committee, testified that if, after these 44 tracts were harvested, the Bureau of Land Management and the Forest Service fully implemented the Interagency Scientific Committee strategy throughout the range of the northern spotted owl in Washington, Oregon, and California, the probability that the species would become extinct in the next 100 years would be low. [Jack Ward Thomas, transcript, page 1993] The benefits of the sale tracts vis-a-vis the survival of the northern spotted owl are only one of the non-market benefits of the 44 tracts. Nonetheless, Jack Ward Thomas testified that the survival benefits would be small in the context of full implementation of the Interagency Scientific Committee strategy.

3. WATER QUALITY

Forests stabilize water temperature by providing shading, and forest root systems reduce erosion and sedimentation. Logging can contribute to degradation of water quality through increased erosion and stream siltation. Section 319 of the Clean Water Act requires States to assess and list the existing condition of navigable waters with respect to non-point source pollution. Problems identified in the 1988 Oregon assessment include turbidity, low dissolved oxygen, nutrient levels, sedimentation, erosion, low flow, temperature, insufficient stream structure, and excessive debris accumulation, all of which have the potential to be exacerbated by timber harvest and road construction activities. [Affidavit of Anne Miller, a Portland Audubon Society witness, Exhibit B] The State has identified forestry as a significant contributor to non-point source pollution in the Oregon Coast Range, estimating that 10-15 percent of streams are affected by forestry. [Anne Miller, transcript, pages 3851-3852]

Bureau of Land Management Exhibit 12 (page 48) indicated that:

> *Mass soil movement events ... are probably the erosional process that has the greatest impact on water quality and aquatic habitat. Mass soil movement is considered the most common and natural type of soil erosion on the Coos Bay District. It is unavoidably accelerated, on steep slopes, by road and landing construction and by clearcutting and burning.*

Water quality degradation from soil erosion may have a significant effect on fisheries. This is discussed in Volume 1, Chapters 3 and 4, pages 153-157 of the U.S. Forest Service's Final Environmental Impact Statement on management for the northern spotted owl in the National forests. [BLM Exhibit 187] Anne Miller maintained the 15 distinct salmon stocks that could be affected are at a moderate to high risk of extinction. [Affidavit of Anne Miller, page 10] This is supported by William Ferrell, a Portland Audubon Society witness:

> *. . . many of the Coast Range's coastal salmonid stocks are facing extinction due, in large measure, to habitat alteration resulting from logging -- some stocks have already been lost entirely.* [Affidavit of William Ferrell, page 14]

William Ferrell addressed the water quality effects of the 44 sales: " . . . little, if any protection for streamcourses has been provided for in much of the cutover area," and "sale will increase the rate of soil erosion by about 2 to 3 fold over the naturally occurring rate." [Affidavit of William Ferrell, page 13] In rebuttal to the Anne Miller testimony, Bureau of Land Management witness William Brookes testified that the Bureau's planning procedures address "the effects of proposed management actions and identify specific contractual stipulations or mitigation to minimize environmental impacts." [Rebuttal affidavit of William Brookes, page 5]

Specific details regarding the Bureau of Land Management's current management provisions addressing water quality, specific fish species, and a wide variety of natural resource factors together with the relationship of these provisions to State and Federal requirements are provided in the 1990-1991 analyses of the management situation for the Salem, Eugene, Roseburg, Coos Bay, and Medford districts. [BLM Exhibits 208-212]

Implications for the 44 Sales

According to the Environmental Protection Agency, the proposed sales have the potential to adversely affect at least 18 rivers and creeks with existing water quality problems, as identified in the Section 319 Assessment. Further, some of the sales are located in watersheds that may affect rivers listed as water-quality-limited in the State's 1990 report, as required by Section 305(b) of the Clean Water Act. [Affidavit of Anne Miller, Exhibit B] Information was not provided for the record to assess the extent of these impacts or to evaluate (in dollar terms) the water quality effects of the 44 sales.

4. OTHER ENVIRONMENTAL CONCERNS

Although the spotted owl is the only old-growth-dependent species currently on the list of threatened or endangered species, several other species in these forests are candidates for listing and are under review by the FWS or the States, and one species (the marbled murrelet) has been proposed for listing by the Fish and Wildlife Service. Not all of these other species are exclusively old-growth dependent. Some are, but others are not, but have ranges which extend into the old-growth areas. Animals associated with these forests (other than the spotted owl) include bald eagles, pileated woodpeckers and northern flying squirrels, as well as a rich assemblage of distinctive plants and animals. Loss of this ecosystem would lead to an associated loss of biological diversity. [Affidavits of Portland Audubon Society witnesses William Ferrell, pages 5-6 and 15; Anne Miller, page 9; and Jerry Rust, page 7]

Although there is a lack of quantitative analysis regarding air quality effects of the proposed sales, degradation of air quality from burning of the slash is another environmental concern. [Affidavit of Anne Miller, page 10]

Implications for the 44 Sales

Sufficient information is not available in the record to monetize these other environmental concerns.

5. SOCIOLOGICAL EFFECTS

Background

Any abrupt change in the way society is organized to conduct its activities has social costs and benefits, and rarely are the cost burdens and attendant effects distributed uniformly throughout society. Job loss is often accompanied by elevated rates of diminished self-image, depression, anger, divorce, juvenile delinquency, family violence, substance abuse, and suicide. [Affidavit of Robert Lee, an O&C Counties witness, pages 13 and 22] Some of these effects are the reflection of reduced income and economic status; other effects are in addition to the income losses. Even those who do not suffer directly through loss of employment or income experience pain and are worse off because of the compassion that they feel for those who are suffering.

Although not quantified in the record, there was evidence to suggest that there are substantial effects on people's reactions to the 44 sales in the context of broader sociological issues, even if they are not personally affected through such a direct means as job loss.

Robert Lee offered testimony on sociological effects resulting from curtailment of timber harvest. While not oriented specifically to the 44 sales, Robert Lee's testimony does address the social consequences that may result from uncertainties regarding the future of the timber industry, and the social context in which the 44 sales may be viewed.

Robert Lee asserted the expectations and perceptions of communities and individuals are important. Timbering communities have previously experienced economic dislocations, most recently in the early 1980s. However, Robert Lee believes that communities and individuals reacted differently in the past to such periodic downturns because:

> *. . . people are willing to take their lumps on market cycles, and they see that as the American way. But when the federal government gets involved in shifting resources and breaking historic commitments, they see that as very, very different, even though the economic consequences can be the same, the experience is one of betrayal, of violation of these social contracts, and of the government intervening in the lives of people in ways that are inappropriate.* [Robert Lee, transcript, pages 1623-24]

Robert Lee testified that these people believed the government had provided "long standing assurances of permanent wood supplies." [Affidavit of Robert Lee, page 11] Consequently, even though there had been some "warning" of potential harvest reductions with respect to National Forest lands:

> *The majority of BLM managed timber lands continued to be managed under the O & C Act, which assures sustained-yield timber production for the benefit of local communities. Therefore, communities dependent on BLM timber supplies had no warning of reductions. The lack of warning exacerbated the adverse emotional, psychological and social impacts of the current disaster.* [Affidavit of Robert Lee, page 9]

However, the belief held by individuals and communities that the government had incurred an obligation to provide timber supplies is not, according to Lee, based on their reading of law, but on "cultural traditions and common understanding." [Robert Lee, page 1615] Consequently, "breach of these long-standing 'social contracts' came as a shock to people who trusted their government, especially after planning processes had repeatedly issued assurances of continued timber supplies." [Affidavit of Robert Lee, pages 10-11]

Summary of Evidence Concerning Sociological Effects

Robert Lee testified that there is a "well-established cause and effect relationship between sudden reductions in timber harvesting and localized economic, social, and psychological effects." However, he acknowledged that "there is considerable uncertainty about the extent of these causal linkages" and little is known about the severity of problems and the likelihood of recovery. [Affidavit of Robert Lee, page 3]

What is different about the current timber situation, according to Robert Lee, is that it results from change induced by a governmental decision. Thus, "the causal agency is not an act of God or impersonal market forces, but is instead a policy choice made by administrative agencies and/or elected officials." [Affidavit of Robert Lee, page 7] This is exacerbated by widespread negative portrayals of loggers as "tree killers" or "land rapists." [Affidavit of Robert Lee, page 13 and page 22]

Robert Lee's testimony concluded that ". . . our society will pay very high social costs for failing to take responsibility for the devastating social impacts administrative agencies are imposing on people in government-dependent communities."

W. Edward Whitelaw, a Fish and Wildlife Service witness, addressed the subject of individual and community perceptions from a different perspective. According to W. Edward Whitelaw, the social and economic consequences of maintaining historic commitments to timber would not be beneficial since a premier strength of Oregon is that many people, "especially those with greater education and mobility want to live here and take advantage of the state's high-quality natural environment," and a key component of Oregon's future planning strategy is the enhancement of the state's quality of life:

> *Perceptions about the quality of Oregon's environmental resources are at least as important to Oregon's economy as their physical and biological status. If, by granting the request for exemption, the Committee causes workers, families, investors, and the managers of firms to perceive that the environmental component of Oregon's quality of life is likely to deteriorate, the result will be fewer jobs and lower incomes, on average, for future Oregonians.* [Affidavit of W. Edward Whitelaw, pages 20, 22-23, 26]

Consequently, W. Edward Whitelaw asserted that maintaining familial and social ties would be best accomplished by expanding the economy of the entire region so that displaced workers can find jobs sufficiently nearby to maintain those ties. [Affidavit of W. Edward Whitelaw, page 24]

Fish and Wildlife Service Exhibit 70 examined the issue of community stability as it relates to the forest products industries. The Exhibit states,

> *In general, we found that counties with higher dependence on forest products industries (specifically SIC 24 where both industries were present) were more likely to experience higher unemployment than counties with less dependence on forest products.* [FWS Exhibit 70, page 163]

To increase community stability it is necessary to "...increase the size of the local economy, or increase the diversity of the local economic base (or both)." [FWS Exhibit 70, page 165] The Exhibit goes on to state, "Adjustment assistance cannot solve all problems, but like economic and market development, it can help provide stability to communities." [FWS Exhibit 70, page 173]

BLM Exhibit 227 (also FWS Exhibit 93) examined the distributive effects of U.S. Forest Service attempts to maintain community stability and determined that

> *Departure from a market responsive timber policy can have positive impacts on the wood products sector, but the net effects on the local community are very small. The costs to the public treasury of pursuing such a policy dwarf these small community benefits.* [BLM Exhibit 227 (also FWS Exhibit 93), page 245]

CHAPTER 3

Benefits and Costs of Alternative Courses of Action Consistent with Conserving the Species or Its Critical Habitat

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CHAPTER 3. BENEFITS AND COSTS OF ALTERNATIVE COURSES OF ACTION CONSISTENT WITH CONSERVING THE SPECIES OR ITS CRITICAL HABITAT

INTRODUCTION

In order to grant an exemption, the Endangered Species Committee must find that the benefits of the proposed action clearly outweigh the benefits of alternative courses of action consistent with conserving the species or its critical habitat. Thus, for each alternative course of action that the Endangered Species Committee considers, there must be an assessment of its benefits (positive and negative). This chapter discusses the benefits of alternative courses of action consistent with conserving the species or its critical habitat.

Alternative courses of action, as distinct from reasonable and prudent alternatives, need not be limited to the objectives of the proposed project or the Bureau of Land Management's jurisdiction. They can include other Federal actions, as well as State and private actions.

NATURE OF THE ALTERNATIVES

The alternative courses of actions introduced into the record fall into the following general categories:

- o Allow market forces to determine the appropriate amount of log exports and imports, timbering from non-Federal sources, and use of substitute materials. (This is the "no-action" alternative);
- o Provide additional timber volume from other Federal sources;
- o Ban log exports from private lands, thus diverting logs into the domestic market.

A number of witnesses addressed the question of the availability of timber from other sources, private or public. However, there was limited information provided on the quantitative benefits of any of these potential alternative actions. Although witnesses left the benefits largely unquantified, they discussed at length how any potential benefits would be distributed. Table 3.1 provides a summary of valid economic benefits and cost associated with allowing market forces to function and determine the appropriate amount of log exports and imports, timbering from non-Federal sources, and use of substitute materials. This is the alternative course of action with the largest potential benefits. The benefits and costs associated with other alternatives are treated in the text. Appendix 3 explains the derivation of the entries in Table 3.1.

1. ALTERNATIVE DOMESTIC TIMBER SUPPLIES

Summary of the Evidence

One witness suggested that the reentry of the Forest Service in the stumpage markets of the Douglas-fir region in early April, 1992, "could mitigate increases in stumpage prices . . . that could accompany a perceived recovery from the current economic recession." [Rebuttal affidavit of Richard Haynes, a Fish and Wildlife Service witness, page 2] Richard Haynes added that when the Forest Service resumes its timber sale program, it will be offering several times the volume of the combined 44 sales.

Other witnesses disagreed, asserting that there was little possibility of increased harvest from other sources. Paul Ehinger, a Northwest Forest Resource Council witness testified that all public sources throughout Oregon are committed to domestic processing and none have any new opportunities to provide logs for Western Oregon mills. He added that Forest Service lands are not an alternative either, because the U.S. Forest Service has been prevented from offering timber by Judge Dwyer's injunction. [Affidavit of Paul Ehinger, pages 6-7]

The extent to which additional timber might be available from other sources depends on a number of factors including: the price of timber, the time period over which the additional supplies might be forthcoming, and the availability of additional supplies from Forest Service and Bureau of Land Management sales. The issue of the "timber supply response" was addressed in detail in Chapter 2, Elasticity of Supply and the Timber Response. While it proved difficult to evaluate much of the evidence because the scenarios presented were not comparable, there was general agreement that increases in private timber harvests by both Westside producers and other domestic producers could not be sustained over a long period.

Nature of the Benefits and Costs

The types of benefits and costs associated with obtaining timber from alternative sources are similar to those identified for the proposed actions. There are market effects, consisting of timber production benefits and increased employment, and there are non-market effects, consisting of lost recreational opportunities, increased environmental disturbances, and avoided sociological effects. Each is addressed below.

Table 3.1. Estimated Magnitude of Economic Costs and Benefits of Market Alternative

Timber Production Benefits

National	Western Oregon
Total Stumpage Value: $0-10 million.	**Share of National Stumpage**: $0-5 million.
Silvicultural Benefit: Close to $0.	**Share of National Silviculture Benefits**: Close to $0.

Employment Benefits

National	Western Oregon
Higher Wages: Range from $0 to a maximum of $10.7 million.	**Higher Wages within the Region**: Range from $0 to a maximum of $4.1 million.

Sociological Benefits

National	Western Oregon
Desirable Effects on Individuals, Families, and Communities: Unpriced. Market adjustments produce increased employment and avoided sociological effects.	**Desirable Effects on Individuals, Families, and Communities within the Region**: Unpriced. Record indicates adverse effects from cumulative timber withdrawals. Market adjustments produce increased employment and avoided sociological effects.

Costs of the Proposed Actions

National	Western Oregon
Recreation Costs: Small.	**Recreation Costs within the Region**: Small.
Decreased Existence Values Experienced: Close to $0.	**Decreased Existence Values Experienced within the Region**: Close to $0.
Other Environmental Costs: Likely to be small.	**Other Environmental Costs within the Region**: Likely to be small.

Stumpage Value

If sufficient timber from elsewhere in the nation became available to replace that from the 44 sales, it is unlikely that it would have a stumpage value equivalent to that lost by not harvesting the 44 tracts. For the stumpage values to be equivalent, the substitute logs would have to contain similar quality wood, and the yields would have to be sustainable. The wood in the old-growth forests of the Pacific Northwest is among the most highly prized anywhere. Substitute sources are unlikely to be of such quality, and, as indicated above, the witnesses agreed that any domestic private timber response is unsustainable. Under these circumstances, the stumpage benefit associated with a private timber response comes only from accelerating harvests which were planned for a few years from now. Hence, the gain to the nation is only the value of the timber harvested today less the present value of the forgone future harvests.

Table 3.2

Percentage Change in Present Value of Stumpage due to Accelerated Harvests

Interest Rate	5 yrs	10 yrs
4.0	2.2%	6.8%
8.5	20.8%	39.0%

Table 3.2 gives the percentage gains from harvesting timber now rather than 5 or 10 years from now. The most optimistic entry in the table indicates that if accelerated harvests could be sustained for 10 years before having to reduce private timber cuts, the value of the privately-owned standing timber could be increased by 39.0 percent (assuming an interest rate of 8.5 percent). If accelerated harvests could only be sustained for 5 years (and the interest rate were 4 percent), the gain to the nation would only be 2.2 percent. At best, accelerated harvests only offset about 40 percent of the stumpage value that would be lost by not harvesting the 44 tracts, and the offsetting gain would only be that large if the timber response (public and private) amounted to 219 MMBF (short-log scale). (See Appendix 3 for derivation of entries in Table 3.2.) None of the witnesses believed that there were sufficient other domestic sources of timber available to fully offset the withdrawal of the 44 tracts.

The most optimistic estimates of the private timber response came from Bruce Lippke, a Bureau of Land Management witness (46 percent) and Richard Haynes, a Fish and Wildlife Service witness (75 percent, but this included diversion of log exports). [Affidavit of Bruce Lippke, pages 5 and 9; Affidavit of Haynes, page 3 and rebuttal affidavit, page 2] Using Bruce Lippke's analysis, at best, 18 percent (.46 x 39.0) of the lost stumpage value could be offset from private domestic timber sources, with about half of this coming from the Westside. Most witnesses believed that the private timber response and offset would be far less than this. Similarly, none believed that it would be easy to locate a sustainable, substitute, public source of timber.

Silvicultural Benefits

There would be some silvicultural benefits from harvesting alternative sources of timber sooner, because replanting would occur sooner and subsequent reharvesting would be accelerated. These gains would be extremely small, and can safely be ignored. No witness estimated the magnitude of the silviculture benefits from the timber response.

Employment Benefits

The magnitude of any gains in employment and earnings due to acceleration of timber harvests elsewhere depends directly on the size of the accelerated harvest. A timber response of 219 MMBF (short-log scale) would produce gains in employment and income that would fully offset the loses due to not harvesting the 44 tracts. No witness estimated earnings gains due to the private timber response. Again, accepting Lippke, 46 percent of the lost earnings from withdrawal of the 44 tracts might be offset by a private timber response, with about half of these gains located on the Westside.

Sociological Benefits

To the extent that there is increased employment due to a private timber response, there will be avoided sociological effects. These count as a benefit of the private timber response and serve to offset any increased effects in western Oregon due to withdrawal of the 44 tracts. As before, these benefits are unpriced. No evidence was introduced into the record regarding these effects.

Recreational Costs

If the accelerated harvesting occurs in areas which supported recreational activities, recreational benefits will be lost. These costs tend to offset the gains from the timber response. Any private timber response will occur on commercial timber lands, however, and is not likely to alter existing recreational opportunities significantly. Thus, even though these costs are unknown, it seems likely that they are small.

Environmental Costs

Any environmental costs due to a private timber response are also likely to be small. The timber response is likely to be geographically dispersed, and commercial timberlands do not support a level of biological diversity similar to that found in old-growth forests. No witness addressed this issue.

2. INCREASED IMPORTS OF TIMBER AND LUMBER

There is only limited testimony in the record regarding increased imports of logs and none regarding lumber. Paul Ehinger, a Northwest Forest Resources Council witness, testified that due to trade restrictions and technical incompatibilities with domestic processing facilities, log imports are not a viable alternative. [Affidavit of Paul Ehinger, pages 5-6] Con Schallau, a Bureau of Land Management witness, testified that relying more heavily on imports from third world countries would generate greater environmental damage globally than would continued reliance on domestic sources. [Affidavit of Con Schallau, pages 25-26]

There are no national or regional stumpage or silvicultural benefits from imports. There are, however, employment and income gains. Although slightly higher prices may be necessary to attract the imported material, such imports allow industries which are dependent on timber and lumber to continue to function, and prevent employment and income losses which would occur in the absence of the imports. No witness estimated earnings gains due to imports. Bruce Lippke, a Bureau of Land Management witness, testified that imports of wood products (probably lumber) might replace about 45 percent of the logs withdrawn by not harvesting the 44 tracts. It is difficult to convert this estimate of lumber imports into an employment equivalent. There are no domestic employment benefits associated with harvesting the imported timber, and probably most of the milling will occur abroad, as well. Thus, the employment gains from imports are limited to those sectors that work with milled lumber. For purposes of estimating employment effects, it was assumed that a board foot of lumber imports would only result in one-fourth of the employment associated with a domestic board foot of lumber. This assumption was chosen in order to estimate an upper bound on employment effects. Bruce Lippke was the only witness to provide an estimate of the magnitude of the import response.

To the extent that there are gains in employment and income due to imports, there will also be avoided sociological costs.

3. DIVERSION OF LOG EXPORTS

A number of witnesses suggested that logs destined for export be diverted to domestic mills. Richard Haynes, a Fish and Wildlife Service witness, suggested that this diversion could be accomplished by restricting log exports. [Rebuttal affidavit of Richard Haynes, page 4] However, other witnesses suggested that diversion would occur simply by allowing market forces to function.

For example, W. Edward Whitelaw, a Fish and Wildlife Service witness, noted that

> *. . . most, if not all, mills will obtain alternative supplies from other lands or by diverting logs from export markets. The market for logs is similar to other markets: there are multiple mills and exporters buying logs from multiple suppliers, and suppliers make more timber available for sale in response to higher prices. If the 44 timber sales are deferred, we should expect a straightforward market response: mills will seek alternative supplies from their own timberlands, from timberlands of others, or by diverting logs away from exporters; the price will rise; and the mills will obtain alternative supplies in response to the higher price.* [Affidavit of W. Edward Whitelaw, page 9]

Richard Haynes supported Whitelaw's testimony:

> *. . . higher stumpage prices resulting from actions to protect the spotted owl will divert timber from the export market to the domestic market. About one-third of logs exported from the Douglas-fir region are domestic sort logs. That is, they are the same quality, size, species, etc. as are processed in local mills for the domestic market.* [Rebuttal affidavit of Haynes, pages 1-2]

Janet Baker also testified that export logs are not perfect substitutes for larger, old-growth timber, and create technical problems in milling. [Affidavit of Janet Baker, p. 9]

Evidence was introduced concerning the effects of an export ban on timber produced on private lands. Current law prohibits export of raw logs from both Federal and State lands. A number of witnesses (Bureau of Land Management witness Bruce Lippke and Northwest Forest Resource Council witnesses Mark Hamlin, Neil Westfall, Jim Denison, William G. Frohnmayer, Leo Mottau, Sam Konnie, Everett P. Johnson) testified that an export ban would adversely affect private timber producers by forcing them to sell their products at a lower price for processing in domestic mills in addition to adversely affecting workers directly involved in the export trade.

For example, Hamlin testified that

> *. . . a ban on log exports would only result in the transfer of jobs, not the creation of jobs . . . I believe that a ban or tax on the export of my private property--in order to . . . subsidize my neighbor's sawmill by offering him cheap raw material--is unfair, unwise, and unworkable.* [Affidavit of Mark Hamlin, page 2]

William Frohnmayer testified that a ban on timber exports from Oregon ports would not significantly offset the potential drop in Federal sales and would only minimally benefit the pulp mill industry. [Affidavit of William Frohnmayer, page 11] Bruce Lippke testified that

> *. . . there is a substantial body of research showing that any log export ban and especially a private log export ban causes a subsidy through depressed timber prices for processors, and while this may reduce the loss of mill processor income and jobs from owl conservation, it would cause even more income and job losses elsewhere . . ..* [Affidavit of Bruce Lippke, page 17]

Bruce Lippke testified that net U.S. losses from a 2.4 BBF private export ban for the year 1995 would be $257 million, with consumers and timber producers suffering losses of $139 million and $358 million respectively and mill processors gaining $240 million. [Affidavit of Bruce Lippke, page 19] The assumptions used to generate this estimate were not made explicit in the testimony. However, the estimate implies a cost of about $107,000/MMBF. Hence, an export ban on 219 MMBF would cost about $23 million, with consumers and timber producers bearing these costs.

As with imports, diversion of logs statutorily or through the market produces no national or regional stumpage or silvicultural benefits. If log diversions are brought about through the market, there are employment and income gains that will help to offset losses due to withdrawal of Bureau of Land Management tracts. However, if the diversions are effected statutorily, timber producers and those employed in the export industry suffer losses as a result of the public effort to support mill owners and mill workers. The resulting loses in the timber and export industries will necessarily exceed the gains by mill owners and mill workers.

Diversion of logs (by whatever means) reduces the magnitude of the domestic timber response and helps to avoid potential environmental costs associated with such a response. By maintaining employment in milling areas, diversion helps avoid sociological effects associated with not harvesting Bureau of Land Management tracts. However, if the diversion is effected through governmental action, there will be increases in sociological effects elsewhere in excess of those avoided in milling areas.

While the Endangered Species Committee does not have the authority to redirect private logs, it does have the ability to recommend any alternative course of action that is within the jurisdiction of the Federal or State governments to implement. But banning exports is only one policy option that would help support mills and mill workers. Other options are available, and their costs would need to be examined.

4. SUBSTITUTE MATERIALS

Sufficient testimony was not introduced into the record to evaluate the benefits of using wood substitutes compared to the benefits of the proposed actions.

However, Paul Ehinger, a Northwest Forest Resources Council witness, testified that "substitute building materials neither help the mills by providing raw material nor help the employees or communities by providing jobs or economic activity." [Affidavit of Paul Ehinger, page 6] Con Schallau, Bureau of Land Management witness, testified that increased use of nonrenewable resources would have adverse impacts on the global environment and in addition would force the U.S. to rely more on the third world for raw materials. [Affidavit of Con Schallau, pages 25-26]

An analysis of the benefits of increased reliance on substitute materials would require additional information on the costs of alternatives, the responsiveness of producers and consumers to price changes of wood and wood substitutes, and an analysis of the extent to which substitutes would be produced domestically or imported. As with a private timber response, the increased use of wood substitutes induced by market forces would result in employment and income gains and avoided sociological effects that would help offset the effects of withdrawal of the 44 tracts.

CHAPTER 4

A Summary of the Evidence Concerning Whether or Not the 44 Sales are of National or Regional Significance

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CHAPTER 4. A SUMMARY OF THE EVIDENCE CONCERNING WHETHER OR NOT THE 44 SALES ARE OF NATIONAL OR REGIONAL SIGNIFICANCE

INTRODUCTION

To make a decision to grant exemptions, the Endangered Species Committee must determine that some or all of the 44 sales are of regional or national significance. This chapter uses some of the data from Chapter 2 on benefits of the 44 sales. In this chapter, the data are presented in the context of different regional bases to enable the Endangered Species Committee to reach some conclusion about the relative significance of the sales to the particular region that the Endangered Species Committee determines is most appropriate.

Two primary effects of the 44 sales are discussed. One is the extent to which the O&C counties might be affected if the 44 tracts are not sold and harvested. For this analysis, the region is the O&C counties collectively. The second is the effect of the 44 sales on employment in the region. For this analysis, the region is the individual counties in which some of the 44 sales are located. In addition to the effects of all of the 44 sales on O&C counties and on employment, a summary table is presented which highlights selected characteristics and effects of each of the 44 sales individually.

BACKGROUND ON THE REGION

The definition of the relevant economic region plays a significant role in assessing the severity of the regional effects from the 44 sales. For example, if the region as defined for analysis is a large geographical area such as the nation, the relative effect of 100 hypothetical jobs lost in one county may appear small even though the effect is felt severely in that county. Conversely, if the defined region is a small geographical area such as a community, the relative effect of the same 100 hypothetical jobs lost may appear catastrophic. Thus, the regional effects of the 44 sales depend on how regional is defined.

A number of definitions of the relevant region were offered in testimony. Three economists identified the Douglas-fir Region. [Affidavits of Fish and Wildlife Service witnesses Richard Haynes, page 3; W. Edward Whitelaw, pages 11-12; and Bureau of Land Management rebuttal witness John Mitchell, transcript, page 3566] This region encompasses the western portions of Washington, Oregon, and northern California. Richard Haynes testified that the trade of logs moves "quite freely" among these three areas. [Richard Haynes, transcript, pages 3465-66] Other witnesses testified to a much smaller region ranging from individual communities, [Rebuttal testimony of Robert Lee, an O&C witness, page 5] to Coos and Douglas Counties, [Testimony of Paul Ehinger, a Northwest Forest Resources Council witness, transcript, page 1586] to the five counties where the sales are located. [Affidavit of David Cox, an O&C counties witness, page 13].

In this chapter, data will be presented with different geographical and political boundaries constituting a region. In each case, the region selected will be based partially on what seems most appropriate in each particular context to define as a region and partially on the availability of data. For the analysis of O&C Counties, the 18 Counties that have O&C lands are considered as the region. For employment, the individual counties in which some of the 44 sales occur are considered as the relevant regions. Whatever regions are used in the analysis within this report are offered to provide the Endangered Species Committee with a perspective on the significance of some or all of the 44 sales.

1. GENERAL CHARACTERISTICS OF THE REGION

Table 4.1 provides some general information on timberland area within the area in which the northern spotted owl is distributed. It is intended to provide a general context for the 44 sales. Even here, the reader is cautioned about using this table to reach conclusions. For example, the 4,448 acres represented by the 44 sales appears as almost negligible when compared against the more than two million acres of Bureau of Land Management forest lands in Oregon. However, under the Bureau's mandate to sell timber on a sustained yield basis, the number of acres available for harvest during a given year will be much smaller than the total Bureau of Land Management timber acreage.

2. CHARACTERISTICS OF THE COUNTIES

The 44 timber sales at issue are located in the six Oregon counties of Coos, Douglas, Lane, Polk, Lincoln, and Yamhill (see Table 4.2). Douglas and Coos Counties would account for 75 percent of the timber volume contained in the 44 sales, followed by Lane with 17 percent and 8 percent in the other three combined. The following general descriptions of selected characteristics of the counties are based on 1990 data from the Oregon Division of Employment [BLM Exhibit 198] and the 1991-92 "Oregon Blue Book," compiled and published by the Oregon Secretary of State. The Bureau of Land Management has provided other historical data on employment trends in its District Timber Management Framework Plans. [BLM Exhibits 53-56]

All data on employment in the various sectors refer to non-agricultural wage and salary employees, and do not include self-employed workers, because data on total employment was not available for all counties. As a consequence, data on percentages of employees

Table 4.1.

Forest Land Base and Timber Harvest in the "Owl Impact Region," Which Includes the Western Portions of Washington, Oregon & Northern California

	Land Ownership				
Category	USFS	BLM	Other Public	Private	Total
Forest Land Area (thousands of acres):					
Region	14,945	2,106	4,462	17,362	38,875
Oregon	7,499	2,094	1,173	7,123	17,889
44 Sales	0	4	0	0	4
Designated Critical Habitat for Spotted Owl (thousands of acres):					
Region	5,675	1,154	58	0	6,887
Oregon	2,211	1,046	0	0	3,257
44 Sales	0	<1	0	0	<1
Average Timber Harvest, 1980-1989 (MMBF):					
Region	4,090	880	1,340	8,240	14,550
Oregon	2,440	870	370	2,990	6,670
44 Sales (total)	0	177	0	0	177

SOURCES: Data on forest land area and average harvests from BLM Exhibit 191, Appendix A, Tables A.1. and x; the "owl impact region" includes portions of Washington, Oregon, and Northern California. Data on Critical Habitat acreage from NFRC Exhibit 13. Timber harvest for the 44 sales was converted to long-log scale to conform to the other numbers (.81 X 219 MMBF = 177 MMBF).

Table 4.2

Selected Characteristics of Counties Containing the 44 Sales

County	Area (sq.mi.)	Population (number)	Nonagricultural Wage&Salary Employees (number)	Timber Employees (number)	Unemployment Rate
Douglas	5,071	94,700	33,740	8,340	8.4%
Coos	1,629	60,100	19,530	2,370	9.0%
Lane	4,620	283,500	118,500	10,100	5.8%
Lincoln	992	38,900	13,810	460	6.0%
Polk	745	49,000	10,755	889	5.5%
Yamhill	718	65,000	21,134	1,299	5.3%

SOURCES: BLM Exhibit 198 for Douglas, Coos, Lane and Lincoln Counties. For Polk and Yamhill Counties, for which data in the record were available only for the Metropolitan Statistical Areas containing those counties, data were obtained from the Oregon Employment Division.

in a particular sector are somewhat higher than they would be if they were a percentage of total employment.

Douglas County

Douglas County, the largest in size of the six counties with an area of 5,071 square miles, has a population of 94,700 and is largely rural. Of the six counties, Douglas in 1990 had the largest proportion of its labor force employed in timber-related manufacturing (25 percent) and only five percent in non-timber-related manufacturing. Agriculture is another important economic factor in the County and includes field crops, orchards and livestock. Eighteen percent of the work force is employed in the retail trade and 18 percent in the services fields. Its overall 1990 unemployment rate was 8.4 percent, compared to a statewide rate of 5.5 percent.

Coos County

Coos County has a population of 60,100 and a land area of 1,629 square miles. Twelve percent of the labor force is employed in timber-related manufacturing. With its approximately 40 miles of seacoast, tourism and fishing are important sectors of the

County's economy, along with forest products. Agricultural specialty products also are important. The International Port of Coos Bay is a large forest-products shipping port, and five percent of the labor force is employed in trucking, warehousing, and water transportation. Seven percent of the work force is employed in non-lumbering manufacturing; 21 percent is engaged in retail trade. Its overall 1990 unemployment rate (nine percent) was the highest of the six counties.

Lane County

Lane County has the highest population of the six counties, at 283,500, and contains an area of 4,620 square miles. The city of Eugene, the home of the University of Oregon, is at its center, but the area around it is largely rural. Service-related employment is the highest of the six counties at 24 percent, followed by retail trade at 21 percent. It has a relatively high public-sector labor force of 21 percent and non-lumber manufacturing of nine percent. Timber-related manufacturing employs 8.5 percent of the labor force. In 1990 the County's overall unemployment approached the statewide average, 5.8 percent.

Lincoln County

Lincoln County, bordering the Pacific Ocean, is popular for sport fishing, and sizeable charter and commercial fishing fleets operate out of Depoe Bay and Newport. Reflecting the economic importance of recreation and tourism, over half of its labor force (55 percent) is employed in the retail trade and services sectors, and only three percent by timber-related manufacturing. The County has a population of 992 square miles and a population of 38,900, and its 1990 unemployment rate was six percent.

Polk and Yamhill Counties

Polk and Yamhill Counties are both located inland, in the valley of the Willamette River. Lumbering occurs in the foothills of the Coast Range. The non-lumber manufacturing labor force is larger here than in the rest of the counties, at 17 percent and 20 percent, respectively. Polk County has eight percent of its labor force employed in timber-related manufacturing; Yamhill has six percent. Polk County, adjacent to the state capital of Salem, has 20 percent of its labor force in public sector employment, and nearby Yamhill has 16 percent. Retail trade, services, and food processing account for most of the rest of the labor force. Polk has an area of 745 square miles and a population of 49,000, while Yamhill has an area of 718 square miles and a population of 65,000. Polk County had a 1990 unemployment rate identical to the State average and Yamhill's was slightly lower at 5.3 percent.

DISTRIBUTION OF THE TIMBER SALE RECEIPTS

As estimated by the Bureau of Land Management, the stumpage value of the 44 tracts is $69,165,484, based on an average price of $316 per thousand board feet. This represents the minimum bid that the Bureau of Land Management is willing to accept for the timber; and would be, therefore, the minimum amount of money the Bureau would receive if the tracts were sold. Specific tract by tract values for each of the 44 sales is available from BLM Exhibits 1 through 44. The discussion in this section is how those receipts would be distributed and the relative significance to the recipients.

1. BACKGROUND ON REVENUE SHARING WITH OREGON COUNTIES

There are three types of land ownership involved in the 44 sales, each with distinct revenue sharing requirements.

O&C Lands

Most significant, both in terms of land area and amount of revenue sharing to the counties, are the O&C lands. Originally granted to the Oregon and California (hence O&C) railroad, these lands were forfeited to the Federal government because of their illegal sale by the railroad. [BLM Exhibit 193, page 2] Counties containing O&C lands receive 50 percent of the gross revenues generated from timber harvest on these lands, distributed

> *in the proportion that the total assessed value of the Oregon and California Grant Lands in each of said counties for the year 1915 bears to the total assessed value of all of said lands in the State of Oregon for said year, such moneys to be used as other county funds.* [50 Stat. 874, Title II(A), August 28, 1937]

Thus, there are no restrictions on how the counties use their O&C receipts. Table 4.3 presents the long-standing formula for distributing to the counties the 50 percent of total O&C timber revenues.

Coos Bay Wagon Road Lands

Granted in 1869 to the Southern Oregon Company to build a military wagon road between Coos Bay and Roseburg, these lands reverted to the Federal government due to illegal sales.

> *Harvest revenues from this land are used to compensate the two counties in which the lands are located; payments equal the taxes that would have been paid if the land were privately owned. Revenues are divided among the taxing units within*

Table 4.3.

Percentage of O&C Revenues Received by Each County

County	Percentage	County	Percentage
Benton	2.81	Clackamas	5.55
Columbia	2.06	Coos	5.90
Curry	3.65	Douglas	25.05
Jackson	15.67	Josephine	12.08
Klamath	2.34	Lane	15.27
Lincoln	0.36	Linn	2.64
Marion	1.46	Multnomah	1.09
Polk	2.16	Tillamook	0.56
Washington	0.63	Yamhill	0.72

> *which the Coos Bay Wagon Road lands are located, based on each unit's proportion of the combined tax rate for the current year.* [BLM Exhibit 193, pages 2-3]

In 1990, Coos County received $720,561 from Coos Bay Wagon Road land receipts; Douglas County received $108,397. [FWS Exhibit 59, "O & C Receipts -- Disbursements to O & C Counties"]

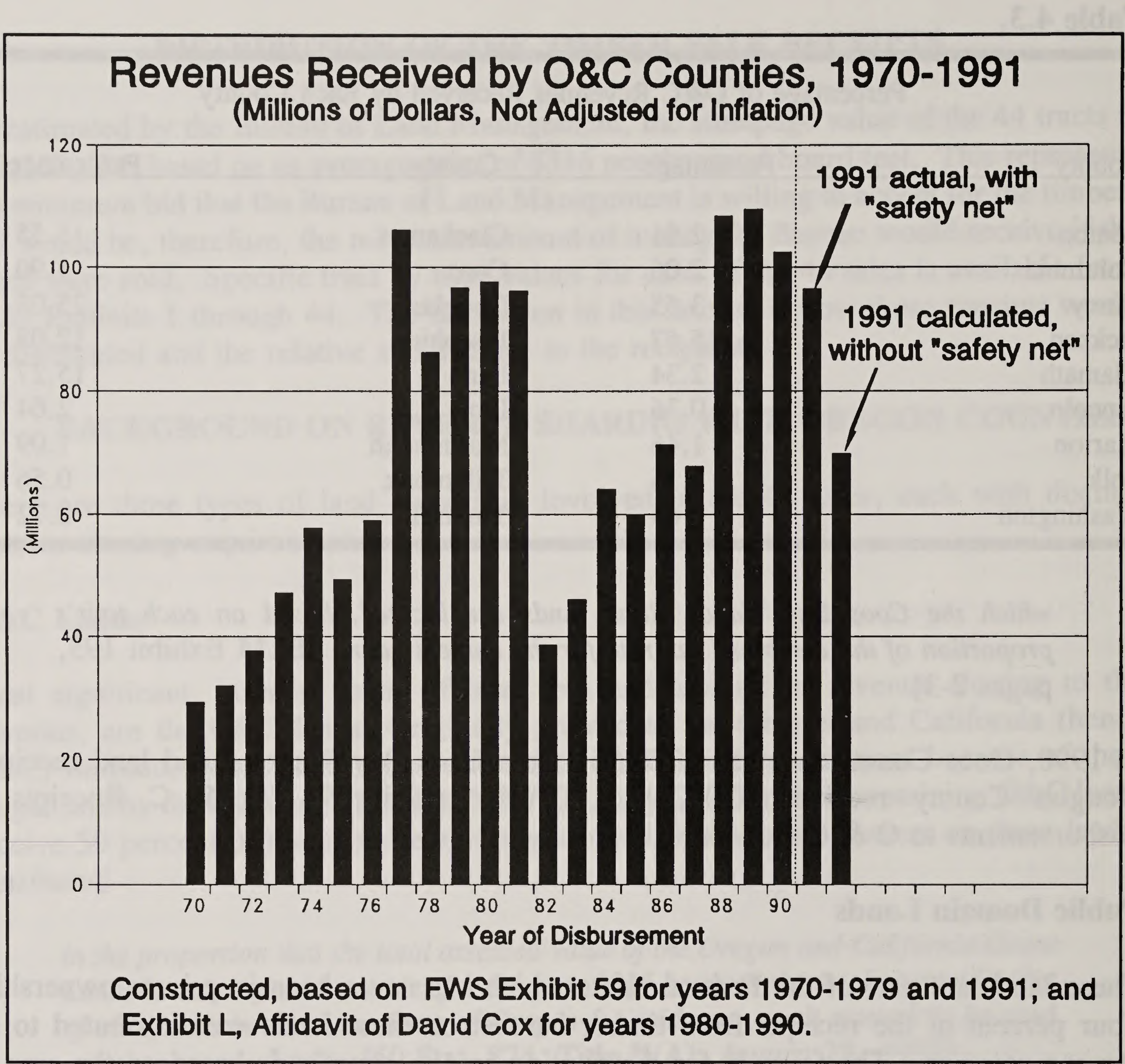
Public Domain Lands

These lands are part of the Federal estate which has never been in private ownership. Four percent of the receipts from timber harvest on these lands are distributed to all Oregon counties. The formula for distribution among counties is based on the area of each county. [BLM Exhibit 193, page 3]

Historical Fluctuations

Figure 4.1 shows substantial variability in revenues to counties between 1970 and 1991. Yearly revenues to counties were derived from two sources. FWS Exhibit 59 provided annual figures by county for the years 1970 to 1991. However, there were apparent inaccuracies in the data (1983 and 1984 had identical receipts and 1990 figures were not multiplied by 50 percent). As a consequence, the Affidavit of David Cox, an O&C witness, Exhibit L, which provides total O&C receipts for years 1980 to 1990, was used for those years.

Although county receipts varied throughout much of this period, Bureau of Land Management timber sales were relatively constant (See Figure 4.2). As William Bradley,

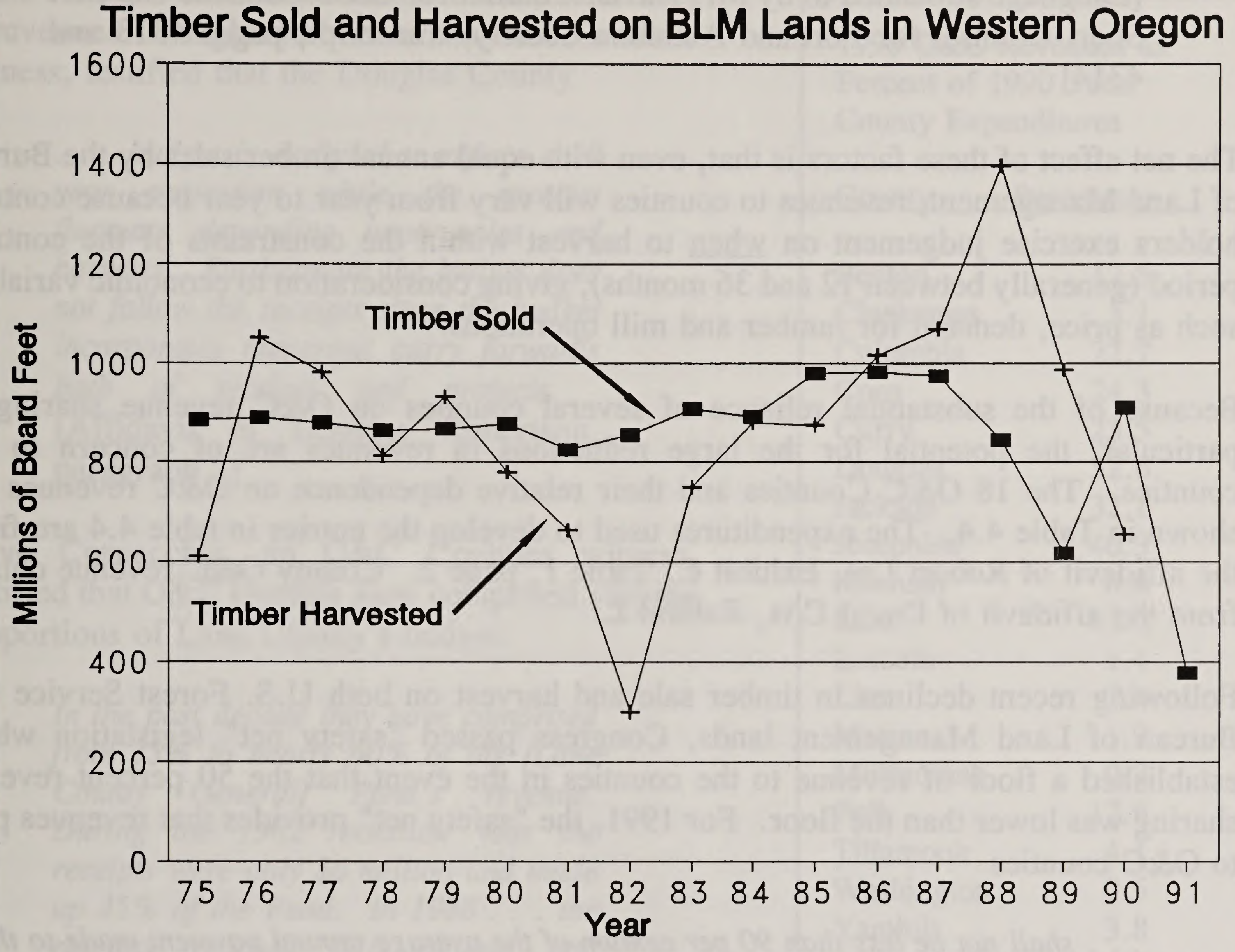


Constructed, based on FWS Exhibit 59 for years 1970-1979 and 1991; and Exhibit L, Affidavit of David Cox for years 1980-1990.

Figure 4.1.

a Bureau of Land Management witness, testified, the Bureau

> *. . . has traditionally interpreted the mandate for the stability of "local communities and industries" as requiring a relatively even flow of volume year to year yielding a stable, predictable quantity of timber on which to base economic decisions. Wide swings in such volumes would produce attendant highs and lows in economic activity or so called "boom-and-bust" cycles. These cycles are not stabilizing and during severe downturns leave communities with joblessness, closed business establishments, bankruptcies, and a host of social problems.* [Affidavit of William L. Bradley, page 17]



Source: Timber sold from Affidavit of BLM Witness William McKillop, Attachment 1. Timber harvested from BLM Exhibit 199.

Figure 4.2.

Revenues received by O&C counties vary due to differences in the price the Bureau of Land Management receives for the timber and the year that the timber is harvested.

> *There are two factors in calculating revenues, both of which are fixed at the time of bidding for an award of sales. For each sale, the two factors are timber volume, determined in thousands of board feet, and price per thousand board feet. Once a bidder is awarded the contract for sale, the price that will be paid at the time of harvest is fixed on a lump sum basis.*
>
> *Later, at the time of harvest, the bidder completes payment to the BLM for the timber based on the contract price and the O & C Counties receive their share of the revenue generated at the ending of the fiscal year in which the harvest occurs. After a contract is awarded, the contract price of timber is not changed. "*

> [Language stipulated to by Mr. Davis, Counsel for O&C Counties and Mr. Sher, Counsel for Portland Audubon Society, transcript, pages 4313 and 4314]

The net effect of these factors is that, even with equal annual timber sales by the Bureau of Land Management, revenues to counties will vary from year to year because contract holders exercise judgement on when to harvest within the constraints of the contract period (generally between 12 and 36 months), giving consideration to economic variables such as price, demand for lumber and mill operations.

Because of the substantial reliance of several counties on O&C revenue sharing in particular, the potential for the large reductions in revenues are of concern to the counties. The 18 O&C Counties and their relative dependence on O&C revenues are shown in Table 4.4. The expenditures used to develop the entries in table 4.4 are from the affidavit of Robert Lee, Exhibit C, Table 1, page 2. County O&C revenue data is from the affidavit of David Cox, Exhibit L.

Following recent declines in timber sale and harvest on both U.S. Forest Service and Bureau of Land Management lands, Congress passed "safety net" legislation which established a floor of revenue to the counties in the event that the 50 percent revenue sharing was lower than the floor. For 1991, the "safety net" provides that revenues paid to O&C counties

> *. . . shall not be less than 90 per centum of the average annual payment made to those counties of their share of the Oregon and California land-grant receipts collected during the three-year baseline period of fiscal years 1988 through 1990: Provided, That in no event shall this payment exceed the total amount of receipts collected from the Oregon and California grant lands during fiscal year 1991.* [Public law 101-512, November 5, 1990, sec. 315]

For 1992, the "safety net" is essentially the same, but is based on the average of five years, 1986-1990. [Public law 102-154, November 13, 1991, sec. 317] At present, Congress has not extended the "safety net" to FY 1993 or beyond.

Figure 4.1 shows the difference in the revenue the O&C counties actually received in 1991 under the "safety net", as compared with the revenue they would have received without it. The actual revenue to O&C counties for FY 1991 was $96.6 million; had the "safety net" not been in place, the revenue would have been $69.9 million under the formula of 50 percent revenue sharing called for in the Act. This represents a decrease of $26.7 million to the portion of the revenues that the Federal Treasury would have received.

Some county witnesses testified about the variability in revenues. Douglas Robertson, an O&C Counties witness, testified that the Douglas County

> *. . . budget is designed to reflect a 10 year projection while the receipts fluctuate depending upon sales and harvests. Furthermore the budget does not follow the receipts since the budget incorporates numerous carry forwards both of receipts and projects.* [Affidavit of Douglas Robertson, paragraph 7]

Steve Cornacchia, an O&C Counties witness, testified that O&C receipts have comprised varying proportions of Lane County's budget:

> *In the past decade they have comprised from 35% to nearly 60% of the [Lane County General] Fund's revenue. During the 1982 recession year the receipts were only $6 million and made up 35% of the Fund. In 1988 . . . the receipts reached $16 million and comprised nearly 60% of the Fund.* [Affidavit of Steve Cornacchia, paragraph 5]

Table 4.4.

1990 O&C Revenues as Percent of 1990 Total County Expenditures

County	Percentage
Benton	12.5
Clackamas	5.1
Columbia	22.7
Coos	24.3
Curry	23.5
Douglas	32.6
Jackson	32.1
Josephine	40.3
Klamath	8.4
Lane	11.0
Lincoln	1.4
Linn	7.4
Marion	1.9
Multnomah	0.2
Polk	17.6
Tillamook	4.1
Washington	0.5
Yamhill	3.8

EVIDENCE REGARDING EFFECTS ON OREGON COUNTIES

1. LOSSES TO COUNTY REVENUES

Table 4.5 displays the estimated effects on the counties in terms of the number of dollars that they would have received if the 44 tracts were sold and harvested. The estimates of revenues lost to the counties contained in this section were calculated individually for each sale. Sources for the information and analytical approaches are:

1. Type of land (O&C, Coos Bay Wagon Road, Public Domain), and planned volume of sale in millions of board feet are from the affidavit of David Cox, Exhibit B.

2. Value of timber is taken from "Summary of Information on Individual Timber Sales Subject to Exemption Request" attached to the Bureau of Land Management

closing brief, which cites as its source "the exhibits and affidavits submitted by the BLM witnesses listed for each of the sales." The numbers are also available on a sale by sale basis in BLM Exhibits 1 through 44.

3. Revenue sharing for O&C lands was calculated as 50 percent of the value of the timber, and the share of this total distributed to each county was calculated according to the standard distribution formula (Table 4.3).

   For Coos Bay Wagon Road lands, the total county share was taken from the estimate in the affidavit of David Cox, page 12, and the respective shares of Coos and Douglas counties were estimated on the basis of the average of the average for 1986-1990 as reported in FWS Exhibit 59, "O & C Receipts -- Disbursements to O & C Counties." During these five years, Coos County received 88 percent of Coos Bay Wagon Road land revenues and Douglas County received 12 percent.

   For Public Domain lands, the total county share was calculated on the basis of 4 percent of timber value, and the individual county shares were calculated as equal amounts to each county. Although the distribution formula is based on the area of each county, for this analysis each county was assumed to have the same area.

4. Revenue Sharing as a Percentage of County Expenditures was calculated by comparing total O&C, Coos Bay Wagon Road, and Public Domain revenues to each county with total county 1990 total expenditures as derived from the affidavit of Robert Lee, Appendix C, Table 1.

5. Calculations of potential losses of revenue as a result of not harvesting the 44 sales are based on estimates of when harvest would actually take place, because the funds are provided to counties at the time of harvest, not at the time of sale. Time of harvest was estimated on the basis of the "rule of thumb" provided by William Bradley. The purchasers of Bureau of Land Management contracts to harvest timber have flexibility within the contract period regarding when the harvest actually takes place. William Bradley estimated that, for a three year contract, roughly 10 percent of the timber is harvested the first year, 60 percent the second, and 30 percent the last year. [Affidavit of William Bradley, page 14] Robert Lee also provided a three year "rule of thumb" similar to Bradley's, at 20 percent, 50 percent and 30 percent. [Affidavit of Robert Lee, Exhibit A, footnote 4]

   The effects on county revenue sharing under Robert Lee's "rule of thumb" can be estimated for the first year by doubling the amount shown, and for the second year by subtracting from it the amount in the "Year 1" column.

A major unknown in estimating how revenues from the 44 sales would affect counties is the "safety net." At the time of the hearing, there was no indication that there would be continuation of the "safety net" beyond FY 1992. If the Endangered Species Committee grants exemptions, and assuming the Bureau of Land Management sells the 44 tracts in FY 1992 and they are harvested in FY 1992, the revenues to counties from the 44 sales may be as low as zero (if revenues are low enough to require the "safety net") or as high as $31,129,130 (if total revenues are high enough so that the "safety net" is not required). The same would be true for FY 1993 and beyond if the "safety net" legislation is extended. To the extent that the "safety net" is utilized, the costs that would have been borne by the O&C counties is shifted to the American taxpayer and the Federal Treasury.

The following discussion of effects assumes that the "safety net" will not be continued beyond FY 1992 and that all harvest from the 44 sales will take place after FY 1992. To the extent that harvest does occur during FY 1992, the effects on counties during the first year would be mitigated.

Table 4.5 displays the estimated effects on the counties in terms of the number of dollars that they would have received if the 44 tracts were sold and harvested. The potential effects are estimated on the basis of two possible scenarios.

o The first scenario assumes that all of the timber from the 44 sales would be cut in a single year; this represents the maximum possible single year effect on revenues received by counties from the 44 sales (shown as "Harvested in One Year").

o The second scenario assumes that the timber would be harvested over a period of three years and is based on William Bradley's testimony, which assumes that harvest will take place over three years, of 10 percent, 60 percent and 30 percent, respectively (shown as "Harvested over Three Years"). The effects on county revenue sharing under Robert Lee's "rule of thumb" can be estimated for the first year by doubling the amount shown and for the second year by subtracting from it the amount in the "Year 1" column.

Table 4.6 shows the "lost" revenues in relative terms, as a percentage of each county's 1988-89 budget. It is evident that the relative effect of reductions in O&C revenue sharing would be more severe for some counties than for others. Again, the estimates are presented for the case in which all of the timber is harvested in one year, and in the case in which the timber is harvested over three years of 10, 60 and 30 percent, respectively.

Table 4.5.

Estimated Revenues to O&C Counties Attributable to the 44 Sales

County	Harvested in One Year	Harvested Over Three Years Year 1	Year 2	Year 3
Benton	$ 871,102	$ 87,110	$ 522,661	$ 261,330
Clackamas	1,716,232	171,623	1,029,739	514,870
Columbia	639,770	63,977	383,862	191,931
Coos	2,005,562	200,556	1,203,337	601,669
Curry	1,130,193	113,019	678,116	339,058
Douglas	7,755,581	775,558	4,653,348	2,326,674
Jackson	4,837,663	483,766	2,902,598	1,451,299
Josephine	3,730,357	373,035	2,238,214	1,119,107
Klamath	726,134	72,613	435,680	217,840
Lane	4,714,287	471,429	2,828,572	1,414,286
Lincoln	115,419	11,542	69,251	34,626
Linn	818,666	81,867	491,200	245,600
Marion	454,705	45,471	272,823	136,412
Multnomah	340,582	34,058	204,349	102,174
Polk	670,614	67,061	402,369	201,184
Tillamook	177,107	17,711	106,264	53,132
Washington	198,698	19,870	119,219	59,610
Yamhill	226,458	22,646	135,875	67,937
Totals	$31,129,130	$3,112,913	$18,677,478	$9,338,739

NOTES: An Additional $78,839 from Public Domain lands would be distributed to the other 18 counties in Oregon. Three year harvest receipts are estimated on the basis of 10, 60, and 30 percent, respectively.

2. EFFECTS ON COUNTY SERVICES

It is easier to calculate the overall revenue sharing to counties attributable to the 44 sales than it is to estimate with any confidence the type and extent of county services that might be curtailed. For O&C revenues, by far the largest source of revenues from the 44 sales, the O&C Act does not require earmarking of dollars distributed to the counties.

Several witnesses testified about the effect of revenue reductions to the county governments as a consequence of not selling and harvesting the 44 tracts. O&C witness Gordon Ross of Coos County testified that

Table 4.6.

Estimated Revenues to O&C Counties Attributable to the 44 Sales,
as a Percentage of their 1988-89 Budgets

County	Harvested in One Year	Harvested Over Three Years		
		Year 1	Year 2	Year 3
Benton	3.8%	0.4%	2.3%	1.1%
Clackamas	1.6%	0.2%	0.9%	0.5%
Columbia	6.9%	0.7%	4.2%	2.1%
Coos	8.1%	0.8%	4.9%	2.4%
Curry	7.1%	0.7%	4.3%	2.1%
Douglas	9.9%	1.0%	5.9%	3.0%
Jackson	9.7%	1.0%	5.8%	2.9%
Josephine	12.2%	1.2%	7.3%	3.7%
Klamath	2.6%	0.3%	1.5%	0.8%
Lane	3.3%	0.3%	2.0%	1.0%
Lincoln	0.5%	0.0%	0.3%	0.1%
Linn	2.3%	0.2%	1.4%	0.7%
Marion	0.6%	0.1%	0.4%	0.2%
Multnomah	0.2%	0.0%	0.1%	0.0%
Polk	5.4%	0.5%	3.2%	1.6%
Tillamook	1.3%	0.1%	0.8%	0.4%
Washington	0.1%	0.0%	0.1%	0.0%
Yamhill	1.2%	0.1%	0.7%	0.3%
All Counties	2.9%	0.3%	1.8%	0.9%

NOTE: Three year harvest distribution estimated on the basis of 10, 60, and 30 percent, respectively.

> *The task of ... cutting the Coos County budget would be a daunting one for the Budget Committee. There is no fat to cut--we are already down to the bone, and further cuts that would be needed to make up for the lost revenues would require us to start eliminating the bones themselves.* [Affidavit of Gordon Ross, paragraph 25]

Steve Cornacchia of Lane County testified that

> *Timber receipts from sales on the O&C lands provide a crucial revenue source to the Discretionary Fund.. . . a reduction . . . would reduce an already inadequate system's effectiveness to unconscionable levels. The first services to*

> *go are usually in the area of Sheriff patrols, victim, assistance and other progressive DA programs, and preventative programs for anti-social juvenile behavior.* [Affidavit of Steve Cornacchia, paragraphs 4,6]

O&C witness Dennis Goecks of Yamhill County testified that

> *As unemployment increases in Yamhill County, increased demands are placed on county programs that provide health care, counseling, law enforcement, youth services, food, clothing, and shelter. Such programs are already unable to meet public demand.* [Affidavit of Dennis Goecks, para 3]

O&C witness Doug Robertson of Douglas County testified that

> *Since the 1981 recession, Douglas County has reduced its workforce and programs to reflect the reductions in timber harvest. While it has maintained staff and programs at a reduced level, the county has continued to adopt programs designed to reduce expenditures further. . . While these cost cutting efforts are in place they did not anticipate additional reductions on the BLM lands nor reductions of the magnitude covered by these 44 sales. Absent relief, the county will be forced to curtail essential governmental services including law enforcement and social services.* [Affidavit of Doug Robertson, paragraph 10]

O&C witness E. L. Hockman, Administrator of the Douglas County Department of Health and Social Services testified that the needs for his agency's services increase in times of unemployment and that reductions in O&C revenues to the county would result in reduction or elimination of those services. [Affidavit of E. L. Hockman, pages 3-4]

Robert Lee cited a study done for the Association of O & C Counties indicating that a 15 percent reduction in O & C revenue "would force the five affected counties to reduce essential services," thus causing a substantial deterioration in the quality of life. Curtailment of county services "would coincide with a period of rapid growth in the demand for services caused by increased unemployment and economic dislocation," such as human services, public health care, mental health counseling and housing assistance. Lee acknowledged, however, that the analysis performed for the Association of O & C Counties did not analyze the specific revenue effects that would be caused by withdrawal of the 44 timber sales. [Affidavit of Robert G. Lee, pp. 14-17]

DISTRIBUTION OF EMPLOYMENT EFFECTS

1. BACKGROUND ON EMPLOYMENT

The Oregon State Employment Division expects that about 11,100 workers in the timber industry will lose their jobs permanently during the next five years. Job loss of comparable magnitude has already occurred in the last decade. Between 1979-1988, about 11,400 jobs were lost in the forest products industry, largely as a result of retooling, efficiencies within the production process, and fluctuating market conditions. [FWS Exhibit 68, page 2]

While declines in timber related employment are projected for the future, total employment is expected to grow throughout the State in the future in non-wood product sectors. Between 1976 and 1988, Oregon's wage and salary employment grew by 30 percent. By the year 2000, the State's wage and salary employment is estimated to grow about 10-14 percent over the 1988 level [BLM Exhibit 189, page 11].

Table 4.7 shows the change in timber employment and total wage and salary employment between 1972 and 1990 in each of the O&C counties, as well as subtotals for the 18 Western Oregon (O&C) Counties and the State of Oregon as a whole. In some cases, data were not available for a specific county, so the Metropolitan Statistical Area (MSA) which includes the county was used. Hence, Yamhill County is part of the Portland MSA and Polk County is part of the Salem MSA. In every case except the Salem MSA (which includes Polk County), timber jobs decreased since 1972 (the first year of data in the record), and in every case total jobs increased during the same period.

2. EVIDENCE CONCERNING EMPLOYMENT

Jobs Associated With the 44 Tracts

Using the average of 10.9 jobs directly and indirectly associated with each million board feet (short-log scale) of timber cut, the harvesting of the 44 sales would involve the equivalent of 2,383 jobs for one year. The concern here is how jobs associated with the 44 sales might affect the employment picture of the various regions, and the demand for social services by the counties in the region.

Table 4.8 shows the direct employment effects of the 44 sales relative to nonagricultural wage and salary lumber and wood products employment in each county in which some of the 44 sales occur. The effects are presented in two scenarios. One assumes that all 44 sales would be harvested in a single year. The other assumes that timber from the 44 sales would be harvested in three years, 10 percent the first year, 60 percent the second, and 30 percent the third.

For this analysis, as in Chapter 2, an average of 4.6 jobs per million board feet (short-log scale) is used for estimating employment effects of the 44 sales directly related to the timber industry. [Based on Affidavit of David Cox, paragraphs 44 and 46, adjusted from 5.7 jobs/MMBF (long-log scale) to reflect the Bureau of Land Management's use of the short-log scale for estimating timber volume]. (See Chapter 2.)

Table 4.7

Change in Wage and Salary Employment in Oregon (1972 to 1990)

County (or MSA)	Timber Employment 1990	Timber Employment % Change From 1972	Total Employment 1990	Total Employment % Change From 1972
Portland MSA (Yamhill)	7,600	-32.4%	655,200	+43.7%
Salem MSA (Polk)	3,800	22.6%	133,100	+68.1%
Lane	10,100	-33.6%	140,400	+53.9%
Coos	2,370	-55.0%	25,010	+16.0%
Douglas	8,340	-7.0%	42,010	+39.7%
Lincoln	460	-39.5%	18,560	+75.9%
Jackson	5,320	-6.7%	67,720	+62.7%
Benton	1,420	-11.3%	37,200	+75.8%
Clatsop	740	-22.1%	17,340	+47.8%
Columbia	1,090	-12.8%	16,150	+38.6%
Curry	740	-50.7%	9,230	+69.0%
Josephine	1,990	-19.8%	24,290	+71.2%
Linn	4,260	-21.1%	40,550	+44.3%
Tillamook	410	-69.9%	8,750	+25.2%
Subtotal Western Oregon	48,640	-24.9%	1,235,510	+49.0%
Oregon	63,600	-17.7%	1,409,000	+57.7%

SOURCE: Percentage change was calculated using data from BLM Exhibit 198, Oregon Labor Statistics. The Timber Employment columns include the lumber and wood products category of nonagricultural wage & salary employment. The Total Employment columns are not limited to wage & salary employees; thus the number of employees shown here may be higher than those shown in Table 4.2 which includes only nonagricultural wage & salary employees.

Employment multipliers, such as 10.9 jobs/MMBF (short-log scale), generally account only for the private sector. Thus, in Oregon these multipliers do not include any reductions in public employment that might be associated with revenue losses to the O&C counties or to the Bureau of Land Management. However, the potential effects on county revenues were discussed in the previous section of this chapter. It can be assumed that some of the effects of revenue losses to the counties has the potential to translate into reduced county employment, depending on the magnitude of revenue losses.

Approximately 50 percent of the timber volume associated with the 44 sales is located in Douglas County; 18 percent and 17 percent occur in Coos and Lane Counties, respectively. The remaining eight percent is distributed between Lincoln, Polk and

Yamhill Counties. In terms of percentage of timber employment, the 44 sales would have the greatest relative effects on Coos, Douglas, and Lincoln Counties. Data are also provided for Coos/Douglas/Lane Counties, the six exemption counties, Western Oregon, and the State of Oregon to provide other regional contexts for evaluating the sales.

Table 4.8

Estimated Direct (Timber) Jobs Associated with the 44 Sales As a Percent of 1990 Non-Agricultural Wage and Salary Timber Employment

County/Region	Harvested in One Year	Harvested Over Three Years Year 1	Year 2	Year 3
Coos	7.6%	0.8%	4.5%	2.3%
Douglas	6.8%	0.7%	4.1%	2.1%
Lane	1.7%	0.2%	1.0%	0.5%
Lincoln	6.0%	0.6%	3.6%	1.8%
Salem MSA (Polk)	0.5%	0.0%	0.3%	0.1%
Portland MSA (Yamhill)	0.5%	0.0%	0.3%	0.1%
Coos, Douglas, Lane	4.4%	0.4%	2.7%	1.3%
Exemption Counties	3.1%	0.3%	1.8%	0.9%
Western Oregon	2.1%	0.2%	1.2%	0.6%
Oregon	1.6%	0.2%	0.9%	0.5%

SOURCE: Calculated from lumber and wood products category of nonagricultural wage and salary employment data in BLM Exhibit 198, Oregon Labor Statistics, and from estimates of direct jobs associated with the 44 sales on the basis of 4.6 jobs/MMBF short log.

Table 4.9 shows the estimated total jobs in each county, based on 10.9 jobs per MMBF (short-log scale) associated with the 44 sales in relation to total employment (not limited to wage and salary employment) in the counties. As in previous analyses, the effects are presented in two scenarios. One assumes that all 44 sales would be harvested in a single year. The other assumes that timber from the 44 sales would be harvested in three years, 10 percent the first year, 60 percent the second, and 30 percent the third.

Table 4.9

Estimated Total Jobs Associated with the 44 Sales
As a Percent of Total 1990 Employment

County/Region	Harvested in One Year	Harvested Over Three Years Year 1	Year 2	Year 3
Coos	1.7%	0.2%	1.0%	0.5%
Douglas	3.2%	0.3%	1.9%	1.0%
Lane	0.3%	0.0%	0.2%	0.1%
Lincoln	0.4%	0.0%	0.2%	0.1%
Salem MSA (Polk)	0.0%	0.0%	0.0%	0.0%
Portland MSA (Yamhill)	0.0%	0.0%	0.0%	0.0%
Coos, Douglas, Lane	1.1%	0.1%	0.6%	0.3%
Exemption Counties	0.2%	0.0%	0.1%	0.1%
Western Oregon	0.2%	0.0%	0.1%	0.1%
Oregon	0.2%	0.0%	0.1%	0.1%

SOURCE: Calculated from total employment data (total labor force minus unemployment; this category is not limited to wage and salary employees) in BLM Exhibit 198, Oregon Labor Statistics, and from estimates of direct and indirect jobs associated with the 44 sales on the basis of 10.9 jobs/MMBF short log.

Because the indirect employment effects are not necessarily limited to the county in which harvest occurs, this analysis may overstate the relative effects on individual counties to the extent that indirect employment effects extend beyond the borders of the county. On the other hand, it does provide a sense for the level of employment associated with the 44 sales. The data for Polk and Yamhill Counties are based on the Salem and Portland Metropolitan Statistical Areas, respectively. As a consequence, relative employment effects on these two counties may be underestimated.

Assisting Displaced Workers

Traditionally, lumber and plywood mills have employed unskilled persons with little or no college education. Where specialized skills were required, training frequently occurred on the job. Individuals worked their way through a progression of jobs from greenchain to millwright, gaining experience and in some instances specialized skills. It has been estimated that with existing programs, about 41 percent of the dislocated workers from the timber industry will enter an education/training program. An enhanced program, if one were available, for example offering extensions of unemployment compensation up to 52 weeks, might encourage an additional 1,700 workers to enter training programs. [FWS Exhibit 68, page 26, footnote 11]

Assistance for Communities and Individuals

The general strategy followed in Oregon and other states for assisting displaced workers, their families, and communities involves: [FWS Exhibit 68]

- o Providing individual counselling and career planning;
- o Providing services to families and individual workers where possible;
- o Providing a menu of services including career planning, job-search assistance, education and training, financial assistance, relocation assistance, assistance with pursuing self employment;
- o Improving public infrastructure and increasing public works employment;
- o Providing technical assistance for existing firms and entrepreneurial development; and
- o Community leadership training.

However, none of the above measures can be viewed as a "cure all" and immediate positive effects may be elusive.

State Assistance Measures

A number of State programs exist to assist displaced workers and businesses affected by declines in wood products employment. These programs as they currently operate are described in the affidavit of David Cox, Exhibit I, as follows:

- o Displaced Worker Program: $6 million will be used to support displaced timber workers who are involved in training programs.
- o Targeted Special Public Works Fund: $4 million in loans and grants will be available to support business development projects that create and retain jobs.

- Entrepreneurial Loan Fund: About $350,000 will be used to provide small loans up to $15,000 to businesses owned by displaced timber workers or businesses located in timber dependent communities.

- Targeted Oregon Business Development Fund: $600,000 in loan funds are available to assist smaller businesses expand.

Testimony was received from the following O&C witnesses associated with entities which administer displaced worker programs:

> Cynthia Currin, Assistant Director, Mid-Willamette Jobs Council (MWJC) [Polk, Marion, and Yamhill Counties] testified that MWJC provides direct training in job search and job retention techniques, motivation and other employment-related topics such as self-esteem and goal-setting. MWJC also purchase classroom training and on-the-job training from the local community college, private proprietary schools, and local employers. In 1990-91 it is estimated that MWFC will serve 100 displaced workers. [Affidavit of Cynthia Currin, pages 4-6].
>
> Norm Gershon, President, Umpqua Training and Employment Inc. (UT&E) [Douglas County] testified that UT&E provides individual needs assessments, job-search counseling, classroom training through community colleges, vocational training, and relocation assistance. As of December 20, 1991, 367 dislocated timber workers had requested services and 233 workers were either enrolled or waiting to be enrolled in UT&E programs. [Affidavit of Norm Gershon, Exhibits 1 and 2]
>
> Valerie Demmers, Southern Willamette Private Industry Council (SWPIC) [Lane County] testified that SWPIC provides the following services: career life planning, job search assistance, basic and vocational education, classroom training, relocation assistance, and support services (transportation costs, tuition, child care). Their experience has shown that 80 percent of their clients desire classroom training and 13 percent want remedial education. All clients receive assessments to determine their training needs and all receive job search assistance. Between July 1, 1990 and December, 1991, SWPIC served 849 workers, "...nearly all of whom lost their jobs in the timber/wood products industry." [Affidavit of Valerie Demmers, pages 2, 5-6].
>
> J.J. McLeod, South Coast Business Employment Corporation (SCBEC) testified that SCBEC provides basic education and vocational training; case coordination training; employability development; on-the-job training; job search assistance; relocation assistance. During 1991 302 displaced timber workers requested services, and 289 were either enrolled in SCBEC programs or waiting to enroll.

About 45 percent of the displaced timber workers enrolled in SCBEC programs were receiving vocational/basic education skills training. [Affidavit of J.J. McLeod, pages 2-3 and Exhibit 1]

Lessons from Displaced Worker Assistance Programs

The following general factors have been identified as being important in the success of displaced worker programs:

- The speed at which assistance is provided. The longer the lag between a firm's announcement that it will layoff workers and the initial contact with affected workers and their families, the less successful the assistance program. Employers with 100 or more employees are required to give workers 60-day warning of a pending closure. Many opt to give no notice and pay workers 60-day severance pay. Past studies have found that advanced notice of plant closure tends to increase the probability that displaced workers will find replacement employment with no intervening gap of unemployment and without inducing the firm's most productive workers to quit prior to the closure date. [FWS Exhibit 68, p. 14, footnote 2].

- Location of the displaced workers. Rural displaced workers may face greater adjustment difficulties than urban workers. This is due to more limited opportunities and greater competition for employment in rural areas. Few dislocated families want to relocate, but the limited economic opportunities in rural areas can make relocation mandatory. As many as 40 percent of the participants in the dislocated worker program in Coos and Curry Counties relocate within two years after being laid off, for example, compared with virtually none of those in Lane County [FWS Exhibit 68, p. 16, footnote 5]

- Economic health of the region. Securing replacement employment will be easier in periods of economic expansion. Economic downturns lengthen periods of unemployment.

There is information in the hearing record about the effectiveness of specific assistance efforts:

- Job-search assistance is a cost-effective and valuable form assistance. Nearly all workers require training to improve their job-search skills. There is very strong evidence that job-search assistance aids in reemployment. It is difficult for individual workers to learn of many job openings. Approximately 80 percent of job openings are never listed in the classified ads, for example. Workers in rural areas, distant from metropolitan areas, where most job openings exist, have an especially difficult time learning of job openings. [FWS Exhibit 68, page 17, footnote 7]

- On-the-job training and apprenticeships are valuable placement tools, especially when coupled with incentives for employers to keep individuals on the job longer than the period for which the employer may receive a wage subsidy. Performance based contracting is one way to improve participant screening in determining access to classroom training programs and increase post-program placement and job retention rates. However, attention needs to be given to matching the training with the background and perceived needs of the client workers.

- Longer training and education programs may be required for dislocated workers with few transferable skills. For example, the Oregon Employment Division estimates that approximately 70 percent of those dislocated workers who participate in training programs currently opt for the programs with the shortest duration. If additional financial assistance were available, 38 percent more workers would seek training and more than one-half would opt for longer courses [FWS Exhibit 68, page 18, footnote 8].

- Teaching general skills as well as skills specific to particular occupations or industries is valuable.

- More successful programs develop individual training programs and allow individuals to choose between a menu of available benefits.

Cost of Assistance

Federal funds support the bulk of job-training program expenses in Oregon. Federal funds provided about 58 percent ($152.5 million) of all expenditures on training programs, including those for dislocated workers. The State's General Fund provides 16 percent ($42 million) of total job-training expenditures. The Job Training Partnership Administration program, the Employment Division, and community colleges provide the core of services and assistance to dislocated workers. Under the Job Training Partnership Administration in 1989-1991, the Oregon Economic Development Department disbursed about $53 million in Federal funds to six Service Delivery Areas for job training. About $7.2 million of Federal funds was available during this period to provide services explicitly for displaced workers. The Employment Division will spend approximately $17.5 million of Federal funds and $7.4 million of State funds during the 1990-91 biennium to operate the labor exchange for all workers. [FWS Exhibit 68, page 19]

Funding Administered by Counties

According to testimony by J. J. McLeod, Cynthia Currin, Valerie Demmers and Norm Gershon, the costs incurred in assisting displaced workers range between $3,500 and $5,499 per worker, depending on the services required. These costs do not include costs associated with providing unemployment benefits or additional educational grants, which are administered by the State. The costs of assisting displaced timber workers are approximately equivalent to the retraining and assistance costs incurred by entities serving displaced workers in other regions of the country.

INFORMATION ON INDIVIDUAL SALES

Throughout this report, summaries of evidence and analysis of benefits of the 44 sales have been presented as though the 44 sales were a total, inseparable unit. In one sense, these 44 sales along with the sales that received no-jeopardy opinions are part of the Bureau of Land Management's FY 1991 timber sales program. However, technically, the Bureau requested its Section 7 consultation under the Endangered Species Act on a sale by sale basis. The Fish and Wildlife Service provided its biological opinion on a sale by sale basis as well, even though the biological opinions were provided to the Bureau of Land Management in a single document. [BLM Exhibit 158, Appendix G, page 1]

Table 4.10 provides summaries of information derived from the hearing record individually for each of the 44 sales. The information selected for the summary table is intended to provide a general guide to the relative effect of each sale on local communities and of the nature of each sale. The question of jeopardy to the northern spotted owl was not at issue in the hearing; the biological opinion of the Fish and Wildlife Service was acknowledged. Nevertheless, the summary table contains some references to relationship of each sale to the owl or its habitat.

County

Data on the specific county in which a particular sale is located are from the affidavit of O&C witness David Cox, Exhibit B.

Sale Acres

Data on sale acres contained within each sale were obtained from the Bureau of Land Management closing brief, Summary of Information on Individual Timber Sales Subject to Exemption Request. Data on sale acres are also provided in the Fish and Wildlife Service biological opinion [BLM Exhibit 158, Appendix G] and in summary tables in BLM Exhibits 1 through 44 relating to the "11-40" status of the Bureau of Land Management land within the quarter township. However, because of modifications made to some of the sales after the biological opinion was released, the presumably more recent data provided in the Bureau of Land Management brief were used.

Age of Timber

Data on the age of the stands of timber contained within each sale were obtained from the Bureau of Land Management closing brief, Summary of Information on Individual Timber Sales Subject to Exemption Request. Some of the information was verified from the Environmental Assessments from each sale.

Timber Volume

Data on volume of timber in each sale was obtained from the affidavit of David Cox, Exhibit B. The Exhibit identified the specific volume of timber in tract associated with O&C lands, public domain lands and Coos Bay Wagon Road lands.

Price of Timber

The value of the individual tract was taken from the Bureau of Land Management closing brief. The same information is provided in the Environmental Assessments for each sale. The value is based on an appraisal, and represents the Bureau of Land Management's minimum bid. The unit price of the timber per thousand board feet, which is shown in the table, was calculated by dividing the total value of each tract by the number of board feet divided by 1,000.

Federal Revenues

Federal revenues represent the share of the revenues that do not go to the counties. Federal revenues for O&C lands was calculated as 50 percent of the value of the timber. For Coos Bay Wagon Road lands, the Federal share was calculated to be the total timber value, minus the amount estimated by David Cox to go to counties. [Affidavit of David Cox, page 12] For Public Domain lands, the total Federal share was calculated on the basis of 96 percent of timber value.

These estimates of Federal share apply only if there is no "safety net" legislation protecting the O&C counties from reductions in revenues below a specified level. If the "safety net" legislation is extended beyond FY 1992 or if some or all of the 44 sales are harvested in FY 1992, the Federal revenues from these 44 sales could be as low as zero.

County Revenues

County revenue sharing for O&C lands was calculated as 50 percent of the value of the timber. For Coos Bay Wagon Road lands, the total county share was taken from the estimate in the affidavit of David Cox, page 12. For Public Domain lands, the total county share was calculated on the basis of four percent of timber value.

These estimates of Federal share apply only if there is no "safety net" legislation protecting the O&C counties from reductions in revenues below a specified level. If the "safety net" legislation is extended beyond FY 1992 or if some or all of the 44 sales are harvested in FY 1992, the share to the counties could be as high as 100 percent.

Percent to Counties

This is a simple calculation made by dividing the amount of revenue sharing to the counties by the total value of the timber. The total value of the timber may be calculated by adding the Federal revenues and the county revenues.

Jobs

The number of man-years of employment attributable to each of the sales was calculated on the basis of 10.9 jobs per million board feet (short log scale). This includes the direct employment to harvest and process the timber as well as indirect and induced employment resulting from the sales. This represents the gross employment figure in the sense that it does not take into account reemployment if the sales are not harvested. The calculations of employment effects in Chapters 2 and 3 take reemployment opportunities into account.

Contract Period

The maximum time which the successful bidder would have to harvest a particular sale as specified in the contract was obtained from BLM Exhibits 1 through 44 and the Bureau of Land Management closing brief.

Owl Take

The number of northern spotted owls "taken" as a result of harvesting a particular sale was obtained from the biological opinion for the FY 1991 Bureau of Land Management timber sales program. [BLM Exhibit 158, Appendix G, Appendix 1]

"Take," as defined in the Endangered Species Act, " . . . means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [Endangered Species Act, Section 3(18)]

"50-11-40" Violation

One of the criteria examined by the Fish and Wildlife Service in the Section 7 consultation was the status of Bureau of Land Management lands in each quarter township containing all or part of a sale. In BLM Exhibit 158, Appendix B, the Bureau of Land Management provided a summary of the reasons for jeopardy for each of the 44 sales. A "yes" in the table means that the sale was given a jeopardy opinion at least in part because the quarter township or quarter townships involved would be below "50-11-40" after the sale was harvested.

Critical Habitat

In January, 1992, the Fish and Wildlife Service determined critical habitat for 190 areas that include 6.88 million acres, including 1,046,000 acres of Bureau of Land Management lands in Oregon. The maps of the areas are not in the hearing record. The Bureau of Land Management has identified for the Endangered Species Committee staff those sales, of the 44 in the exemption request, that fall within designated critical habitat. These are identified by a "yes" in the critical habitat column.

Root Rot

Bureau of Land Management witnesses indicated that some of the sales were in areas in which there was a prevalence of root rot, a disease that would cause death to the trees within a few years, whether or not they are harvested. Information on which specific sales have root rot was obtained from the Affidavit of Donald Goheen, a Bureau of Land Management witness, employed by the U.S. Forest Service as a forest pathologist, as well as BLM Exhibits 11, 36 and 37. Donald Goheen testified that it is probable that diseased stands of timber such as occurs in the Root Balls, Tigger Too, and Chicken Delux sales " . . . will never develop the characteristics required for suitable owl habitat." [Affidavit of Donald Goheen, page 3]

Table 4.10. Summary of Information Specific to Each Sale

Sale	County	Sale Acres	Age of Timber	Timber Volume (MMBF)	Price per MBF	Revenue to Federal Treasury	Revenue to Counties	Percent to Counties	Jobs	Contract Period (months)	Take	50-11-40 Violation	Root Rot
Last Yankee	Coos	19	150	1.511	$314	$450,053	$23,986	5.1%	16	12	No	Yes	No
King Smith	Coos	72	80-110	3.979	$240	$477,575	$477,575	50.0%	43	24	No	Yes	No
Brownson Headwater	Coos	104	100-200	6.463	$314	$1,466,374	$564,437	27.8%	70	24	Yes	Yes	No
Fall Apart	Coos	247	100-140	14.074	$305	$2,156,180	$2,132,631	49.7%	153	36	Yes	Yes	No
Elk 24	Coos	103	200+	6.26	$428	$1,339,323	$1,339,323	50.0%	68	24	Yes	Yes	No
Cross Out	Coos	35	140	1.995	$284	$534,389	$31,669	5.6%	22	18	No	Yes	No
Chicken Deluxe	Coos	82	100	4.928	$257	$935,502	$332,389	26.2%	54	36	No	Yes	Yes
Halfway Oxbow	Douglas	65	200+	4.544	$323	$733,186	$733,186	50.0%	50	36	No	Yes	No
Devore Mountain	Douglas	131	125-200+	6.011	$275	$826,570	$826,570	50.0%	66	24	No	Yes	No
Windy	Douglas	181	80-100	12.22	$352	$2,152,222	$2,152,222	50.0%	133	27	No	Yes	No
Bateman & Robin	Douglas	80	200+	5.419	$381	$1,031,354	$1,031,354	50.0%	59	36	No	Yes	No
North Sand Creek	Douglas	117	165-200+	5.165	$296	$765,331	$765,331	50.0%	56	24	Yes	No	No
Amberson Creek	Douglas	149	200+	6.065	$299	$907,368	$907,368	50.0%	66	36	Yes	Yes	No
Callahan 20 Cleanup	Douglas	55	100-200+	2.653	$228	$581,888	$24,245	4.0%	29	24	Yes	Yes	No
Green Cedar	Douglas	43	120	2.653	$249	$633,799	$26,408	4.0%	29	24	Yes	No	No
Barneys Peak	Douglas	67	82-200+	3.227	$292	$470,461	$470,461	50.0%	35	24	Yes	No	No
Four Gates	Douglas	170	150-200+	6.244	$279	$870,513	$870,513	50.0%	68	36	Yes	Yes	No
Camas Valley West	Douglas	217	80-200	8.671	$550	$2,382,649	$2,382,649	50.0%	95	36	Yes	Yes	No
Clabber Creek	Douglas	51	140-200+	2.57	$287	$369,437	$369,437	50.0%	28	36	No	Yes	No
Herb Cluster	Douglas	135	200+	8.161	$343	$1,399,558	$1,399,558	50.0%	89	36	No	Yes	No
Horse Heaven	Douglas	200	80+	9.571	$287	$1,375,481	$1,375,481	50.0%	104	36	No	Yes	No
Renhaven	Douglas	82	180-200+	4.492	$339	$762,255	$762,255	50.0%	49	36	Yes	No	No

Table 4.10. Summary of Information Specific to Each Sale

Sale	County	Sale Acres	Age of Timber	Timber Volume (MMBF)	Price per MBF	Revenue to Federal Treasury	Revenue to Counties	Percent to Counties	Jobs	Contract Period (months)	Take	50-11-40 Violation	Root Rot
Salty Dog	Douglas	116	80-200	1.672	$251	$209,729	$209,729	50.0%	18	24	No	Yes	No
Prego	Douglas	211	80-200	7.054	$237	$1,483,296	$191,032	11.4%	77	36	No	Yes	No
Independence	Douglas	75	160-200+	3.06	$282	$574,346	$288,281	33.4%	33	24	Yes	Yes	No
Luts Breakout	Douglas	51	80	1.68	$225	$189,060	$189,060	50.0%	18	24	No	Yes	No
Moore Coon	Douglas	83	200+	5.379	$380	$1,023,187	$1,023,187	50.0%	59	24	No	Yes	No
Pita Ridge	Douglas	86	200	4.486	$350	$785,998	$785,998	50.0%	49	36	No	Yes	No
Northside	Douglas	108	200+	9.4	$396	$1,860,627	$1,860,627	50.0%	102	24	No	Yes	No
Pea Gravel Clay	Douglas	119	80-200	4.402	$304	$668,179	$668,179	50.0%	48	36	No	Yes	No
Fox Hollow	Lane	56	130-200+	1.887	$255	$240,951	$240,951	50.0%	21	24	No	Yes	No
Alma Ranch	Lane	30	180+	1.477	$324	$239,377	$239,377	50.0%	16	12	Yes	Yes	No
33 and 1	Lane	165	90-180+	7.308	$276	$1,007,762	$1,007,762	50.0%	80	30	Yes	Yes	No
Chopped Hamm	Lane	144	120-200+	5.831	$235	$684,911	$684,911	50.0%	64	36	Yes	Yes	No
Lake Creek	Lane	33	50-180+	1.614	$316	$255,323	$255,323	50.0%	18	18	Yes	Yes	No
Young Leo	Lane	115	170-180+	5.269	$307	$807,765	$807,765	50.0%	57	24	Yes	Yes	No
Table Creek	Lane	37	100	1.402	$227	$159,147	$159,147	50.0%	15	18	No	Yes	No
Stennets Fawn Farm	Lane	89	80-200+	4.54	$312	$707,542	$707,542	50.0%	49	24	No	Yes	No
Eddy Whittaker	Lane	39	180+	1.904	$250	$237,962	$237,962	50.0%	21	18	Yes	Yes	No
Weiss Road	Lane	134	100-200+	5.869	$268	$785,916	$785,916	50.0%	64	30	Yes	Yes	No
Back in the Saddle	Lincoln	78	100-180	6.047	$278	$1,616,141	$67,339	4.0%	66	36	No	Yes	No
Kitchen Door	Polk	51	80-200+	4.012	$340	$682,398	$682,398	50.0%	44	24	Yes	No	No
Tigger Too	Yamhill	58	100	4.103	$358	$734,237	$734,237	50.0%	45	36	No	Yes	Yes
Rootballs	Yamhill	165	50	3.38	$226	$382,205	$382,205	50.0%	37	24	No	Yes	Yes

CHAPTER 5

A Summary of the Evidence Concerning Whether or Not the 44 Sales are in the Public Interest

CHAPTER 5. A SUMMARY OF THE EVIDENCE CONCERNING WHETHER OR NOT THE 44 SALES ARE IN THE PUBLIC INTEREST

SUMMARY OF THE EVIDENCE

The Endangered Species Act provides that, in order to grant an exemption, the Endangered Species Committee must determine "that the benefits of such action clearly outweigh the benefits of alternative courses of action consistent with conserving the species or its critical habitat, and such action is in the public interest. [Endangered Species Act, Section 7(h)(A)(ii)] In its application for exemptions, the Bureau of Land Management argued that the sales are in the public interest because the timber and industry and counties have made plans based on the average annual timber harvest level of 1,176 MMBF in the Bureau's 1980s decadal plan, and because of its legislative mandate to contribute to community stability through the jobs and the county revenue sharing that result from the sales. [BLM Exhibit 158, page 18]

Virtually no witness in the hearing addressed the issue of public interest directly, but the closing briefs of the parties, which generally cited neither witnesses nor testimony, spoke to the issue. The Endangered Species Act does not provide extensive guidance on what constitutes public interest.

Several counsel in their closing briefs quoted the following definition of public interest, which comes from the legislative history of the Act:

> *To be in the "public interest," an agency action must affect some interest, right or duty of the community at large in a way which they would perceive as positive.* [H.R. Rep. No. 1804, 95th Cong., 2d Sess., 1978, as quoted by the Bureau of Land Management, Northwest Forest Resources Council, Oregon Lands Council, and Fish and Wildlife Service]

It is important to note the array of views cited by the parties relative to the public interest. Opinions ranged from the Oregon and California Counties assertion that the "U.S. Congress has legislatively determined that these and all sales made pursuant to the O & C Act are in the public interest;" [O&C closing brief, pages 32-33] to the State of Oregon's claim that it " . . . concurs with BLM's assessment of the local need for a stable timber supply. Unfortunately, the record does not demonstrate that an exemption for these 44 sales will remedy the problem;" [State of Oregon closing brief, page 18] to the Northwest Forest Resource Council's citing an expert's view that " . . . forests must be managed effectively for competing interests;" [NFRC closing brief, page 105] to the Fish and Wildlife Service's proposal that " . . . the Committee grant BLM an exemption only if the public interest in the 44 timber sales is so strong as to overcome the public interest in conserving the northern spotted owl." [FWS closing brief, pages 207-208]

Bureau of Land Management

The Bureau of Land Management brief [Pages 116-117] suggests that the public interest may be ascertained by

1. Balancing of the benefits of the 44 sales against the "speculative and insignificant" benefits accruing to the northern spotted owl if the exemption is denied; and,

2. Assessing the losses of revenues to the O&C Counties and to jobs lost if the 44 sales are not exempted.

Northwest Forest Resource Council

The Northwest Forest Resources Council brief [Pages 104-105] cited testimony that exemptions would help the Bureau of Land Management's ability to finalize future timber management plans, and signal to the country that timber supplies will not be cut off, and testimony that the country must face the issue of increasing demand for wood fiber products while the land base for timber is decreasing.

Oregon Lands Council

The Oregon Lands Council brief [Pages 28-77] pointed to public interest in the same terms as the economic and non-economic benefits and costs that the Endangered Species Committee must evaluate. These include:

1. The localized economic, social and psychological effects from sudden reductions in timber harvest, and addressed by Robert Lee; and,

2. The resultant costs of these changes on: Governmental entities; productivity of workers and businesses; competition; employment; energy supply and demand; and, community stability.

Oregon and California Counties

The Oregon and California Counties brief [Pages 32-33] simply cites the O&C Act in which "Congress has legislatively determined that these and all sales made pursuant to the O & C Act are in the public interest.

Fish and Wildlife Service

The Fish and Wildlife Service brief [Pages 206-214] focused on its claim that the Bureau of Land Management's" allowable sales quantity" is contrary to the public interest and asserted that it is not in the public interest to jeopardize a listed species to provide ephemeral relief to an industry that knowingly overcut its own lands in the assumption that it could do the same to the public's land.

Portland Audubon Society

The Portland Audubon Society brief [Pages 106-108] cites court decisions which found a public interest in preserving old-growth forest, even if there were adverse effects on timber companies and their employees.

State of Oregon

The State of Oregon brief [Pages 17-20] cautions that public interest analysis must consider the negative as well as the positive benefits of the proposed action or the public's interest in it. The State asserts that these sales cannot solve the problem of stability in the timber industry, and that postponing the sales until a recovery or long-term owl management plan is in place would promote both recovery of the owl and long-term stability of timber-dependent communities.

CHAPTER 6

Appropriate
Reasonable Mitigation and Enhancement Measures
Which Might be Considered
by the Committee

CHAPTER 6. APPROPRIATE REASONABLE MITIGATION AND ENHANCEMENT MEASURES WHICH MIGHT BE CONSIDERED BY THE COMMITTEE

BACKGROUND

In order to grant an exemption, the Committee must also establish:

> *. . . such reasonable mitigation and enhancement measures, including, but not limited to, live propagation, transplantation, and habitat acquisition and improvement, as are necessary and appropriate to minimize the adverse effects of the agency action upon the endangered species, threatened species, or critical habitat concerned.* [Endangered Species Act, Sec. 7(h)(1)(B)]

BUREAU OF LAND MANAGEMENT APPLICATION

In its application, the Bureau of Land Management proposed the following: [BLM Exhibit 158, pages 19-20]

1. *Seek Land and Water Conservation Fund monies to purchase suitable spotted owl habitat from willing, non-federal sellers in proximity to known resident owl singles and owl pairs in the Coast Range Province and the identified areas of concern equal to the acreage for which exemptions are granted.*

2. *As an integral part of the proposed action:*

   o *Conduct surveys of timber sale areas and spotted owl sites according Fish and Wildlife Service guidelines.*

   o *Restrict harvest operation including road construction during critical nesting/fledgling seasons if owl sites could be potentially impacted.*

   o *Where practical, close or gate roads that provide access to owl nest sites or core areas.*

   o *Leave snags and down wood/material including large logs on harvest sites where possible.*

   o *Leave cull trees for a diversity of roosting and nesting sites and future snag recruitment where the opportunities exist.*

- *Burn post harvest fuels only as necessary for fuel reduction and to provide planting sites. Avoid requiring the yarding of large unmerchantable logs that could contribute to the large woody debris component.*

- *Limit road construction to a minimum and use aerial logging systems where feasible.*

- *Within partial cut units, leave at least 8-15 trees per acre to provide residual components of spotted owl nesting, roosting, and foraging habitat.*

- *Leave unharvested zones along streams that flow through or are adjacent to harvest units.*

- *Avoid harvest of suitable habitat within the 70 acre core of the best available, most contiguous habitat around the core of a pair or resident single spotted owl.*

3. *In the event that either demographic or genetic isolation of the spotted owl population in the Oregon Coast Range Province would occur at some point in the future, the Bureau would initiate a program to physically transport owls through release of young or egg transfer to alleviate the problem.*

The Federal Register notice of November 13, 1991 [56 FR 219] requested additional information on mitigation measures and their potential effectiveness in reducing impacts on the owl. Site-specific information was also requested concerning quarter townships that would attain "50-11-40" status during the projected harvest period for the 44 sales and thus replace current dispersal habitat that would be lost if the sales were harvested.

SUMMARY OF EVIDENCE

The hearing record contains little information pertaining directly to mitigation, and no witnesses suggested site-specific options for mitigating for northern spotted owl habitat that would be lost if some or all of the 44 sales proceeded. Opinions of witnesses reflect significant differences between the parties on the issue of mitigation, stemming from divergent views on the impact of the 44 sales on the northern spotted owl.

At one extreme, E. Linwood Smith, a Bureau of Land Management witness, stated that " . . . since there is no 'measurable impact' of these 44 sales on the species, mitigation of the 'impacts of the sales' would be unnecessary." This view was based on Smith's assertion that the northern and California spotted owls are the same species and are not rare. [Affidavit of E. Linwood Smith, pages 15-16]

At the other extreme, some witnesses claimed that habitat conditions are already so poor that the stopping of harvest, not the provision of mitigation, is required. Gary Miller, a Fish and Wildlife Service witness, testified that if " . . . conditions are so poor, prudent management would be to maintain the remaining habitat on BLM lands and build on that." [Rebuttal affidavit of Gary Miller, page 6] Similarly, Barry Noon, a Fish and Wildlife Service witness, testified that "when you have a system that is already at risk, that is already in decline, then, that same incremental loss of a critical resource can have very dramatic effects on stabilizing properties." [Barry Noon, transcript, page 3619]

The lack of information on mitigation may reflect the difficulty of applying general principles to a diverse group of timber sales. For example, on the issue of dispersal habitat as the major impact of the 44 sales, Gary Miller testified that "it is not just the acreage of habitat that will be lost but the placement of these sales that is the reason for the concern over the impacts." [Affidavit of Gary Miller, page 6] These spatial concerns, according to Charles Meslow, mean that "mitigation for loss of dispersal habitat is very difficult" because such mitigation for habitat loss must be targeted to the same quarter township in which the timber harvest occurs. [Affidavit of E. Charles Meslow, page 15]

Even Bureau of Land Management witnesses testifying on specific sales indicated that it would be difficult to satisfy certain minimum dispersal habitat conditions due to prior timber activity on adjacent private lands in the checkerboard as well as on nearby Bureau of Land Management lands. For example, E. Kermit Baty, a Bureau of Land Management witness, testified that most private lands "have been cut over in recent years. The owl habitat is fragmented with little contiguous blocks of timber of any significant size." [Affidavit of E. Kermit Baty, page 6] With respect to another sale, Carole T. Jorgensen, a Bureau of Land Management witness, testified that "little suitable habitat in the Willamette Valley remains on BLM and even less occurs on private land." [Affidavit of Carole T. Jorgensen, page 8]

There was significant divergence of opinion among witnesses regarding the precise length of time required before a clearcut area once again becomes northern spotted owl habitat. Barry Noon testified that it "takes many decades to regrow suitable habitat," and cited 80 years as a minimum figure. Larry Irwin, a Northwest Forest Resources Council witness, used a 40-80 year range, and Joseph Lint, a Bureau of Land Management witness, cited 40 years as a minimum figure. [Barry Noon, transcript, pages 3625 & 3651; Affidavit of Larry L. Irwin, page 5; Joseph Lint, transcript, pages 815 & 827]

One reason for the confusion may be that, while the northern spotted owl seems to prefer old-growth forests as habitat, it is known to use younger forests for some of its life functions, such as foraging and dispersal. E. Charles Meslow, one of the members of the Interagency Scientific Committee, testified that the best habitat for all life functions of the owl is old-growth forest, with trees older than 200 years but other age-classes can satisfy certain habitat requirements and provided the following rule of thumb: [Testimony of E. Charles Meslow, page 4]:

200+ years: All life functions.
200-80 years: Foraging and dispersal, but usually not nesting.
80-40 years: Dispersal, but usually not foraging or nesting.
40-0 years: Unsuitable habitat.

Therefore, under the most optimistic of assumptions, it may take four decades for a clearcut to regain characteristics of dispersal habitat, which was a primary issue for most of the 44 sales.

In spite of the apparent lack or agreement or lack of focus on the issue, some witnesses did suggest specific mitigation measures. Gary Miller advocated maintaining the "11-40" condition in quarter townships after harvest by selective harvesting or by acquiring "any private land which contains 11-40 dispersal habitat in the same quarter township as the impacting timber sale(s) and refrain from harvesting until the BLM's lands are in adequate dispersal condition." Gary Miller also suggested acre-for-acre acquisition of suitable habitat or acquisition of unsuitable habitat on a greater than acre-for-acre ratio. [Affidavit of Gary Miller, pages 3-5, & 8] According to information provided by the Bureau of Land Management, at least portions of 37 of the 44 sales are in quarter townships for which the Bureau of Land Management lands already are below the threshold of "50-11-40."

Some testimony addressed the feasibility of employing harvest methods other than clearcutting, as they might have lesser impacts on owls. As noted above, Gary Miller cited selective harvesting as a potential option. William L. Bradley, a Bureau of Land Management witness, stated that "conversion of clear cut sales to partial cut sales may be feasible in some instances depending on topography and stand structure." However, William Bradley also stated that such sales would take more time to prepare and be from one-half to three times as costly to prepare and administer. They also would require more road construction, which creates additional soil and stream disturbance. [Affidavit of William Bradley, pages 10-12]

Robert R. Stephens, a forest manager for Pacific Lumber Corporation, testified that his company's research appeared to demonstrate that owls "will successfully use artificial nesting structures in second growth stands," which, he continued, "may allow us to mitigate for the loss of nesting habitat and enhance reproduction of owls." However, he also stated that such conclusions were "preliminary." [Affidavit of Robert R. Stephens, page 8]

CHAPTER 7

Whether the Bureau of Land Management Refrained from Making any Irreversible or Irretrievable Commitment of Resources

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CHAPTER 7. WHETHER THE BUREAU OF LAND MANAGEMENT REFRAINED FROM MAKING ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

In its application for exemptions, the Bureau of Land Management asserted that, while it had made major expenditures of workmonths in the preparation of the 44 sales, the Bureau

> *. . . has taken no action that would result in the irreversible or irretrievable commitment of any natural resources, particularly those known to be components of spotted owl habitat, related to the proposed actions . . ..* [BLM Exhibit 158, page 15]

During the hearing, the Bureau of Land Management made no indication that it had taken any irreversible or irretrievable actions, and no witnesses claimed that the Bureau of Land Management had done so.

APPENDIX 1

Determining the Costs of Conserving Timber Tracts as Habitat: Structuring the Problem

APPENDIX 1.
DETERMINING THE COSTS OF CONSERVING TIMBER TRACTS AS HABITAT: STRUCTURING THE PROBLEM

INTRODUCTION

Most of the past analyses of the economic and social effects of withdrawing forestland from the timber base in order to protect owl habitat have focused on the economic losses or costs that will result. This approach is consistent with the cost-benefit framework that is commonly applied to the analysis of public policy decisions. In this approach, the benefits are the preservation of the owl habitat, its contribution to the support of the spotted owl population, and other benefits of retaining old-growth and mature forests. The costs are the losses of income that would have been produced in the economy if the trees had been harvested and the logs processed into lumber. Most of the testimony in the record as well as much of the generally available analysis of the economic effects of owl conservation follows this cost-benefit approach. In order to maintain consistency with these analyses, the discussion in Appendix 1 treats the withdrawal of the 44 proposed timber sales as a policy action that incurs costs in order to achieve certain benefits.

The language of the Endangered Species Act, however, requires the Committee to weigh the benefits of the proposed action and the benefits of alternatives. In order to frame the determination in a manner consistent with this statutory requirement, it is necessary to regard the costs of withdrawing the proposed timber sales as the benefits of the proposed action. The text of the report takes this approach.

The Endangered Species Committee must determine the costs which society would incur by not harvesting the tracts in question here, and decide whether these costs are so large (i.e., of regional or national significance) as to warrant exemptions from the provisions of the Endangered Species Act. These costs are largely market-valued. There are also non-market costs which must be taken into account, e.g., environmental amenities and sociological impacts. These non-market costs are not easily measured in dollar terms. In order to simplify the exposition, the discussion focuses first on the market-valued costs, dealing with the non-market costs in a later section of the appendix.

Appendix 1 discusses how economists measure costs, detailing the elements to be included as costs and explaining how to avoid double counting (i.e., counting some costs more than once). The appendix provides an analytic framework which describes how the various factors that affect the costs of not harvesting timber from Bureau of Land Management lands are interrelated and who bears the burden of these costs.

The economic costs incurred by society when tracts of land are placed off limits to timber harvesting are not just the forgone value of the timber from those tracts. There are direct, indirect, and induced effects associated with withdrawals of timberland, and these effects do not occur instantaneously. The effects occur over time as market forces generate changes until a new equilibrium is achieved.

Some arbitrariness is involved in classifying effects as direct, indirect, and induced. The standard convention is to define direct effects as those involving resources employed in harvesting timber and processing it into lumber. Indirect effects are defined as those involving businesses and individuals that service and supply timber harvesting and processing firms, e.g., those who transport the lumber to the mills. Induced effects are those that occur broadly throughout the economy due to reduced spending stemming from lower income levels. For the Committee's purposes it does not matter how each affected resource is classified as long as all effects are accounted for.

It is important to identify and distinguish between regional and national effects, not just because the statute requires it, but because the effects on the region of interest are often larger than those on the economy as a whole. An initial disturbance in a region sets in motion complementary and countervailing forces throughout the economy. A withdrawal of timberland from the harvesting base in six counties in Oregon will induce changes within those counties, throughout nearby areas, in the economy nationally, and in international markets. Because of offsetting responses, the sum of all the impacts (the national effects) can be less than the effects within the initial region. Thus, if one looks only at the changes in national benefits, regional changes will be masked, even though these regional changes could be significant.

The appendix begins by examining the impact of timberland withdrawal in an ideal economy, tracing through the effects to a new market equilibrium and adding up the costs to society nationally. In an ideal economy all resources (land, labor, and capital) move easily from one occupation to another. Unemployment is so brief and transitory that reemployment is essentially instantaneous. Furthermore, in their new jobs resources are able to command approximately the same earnings (wages, rents, and profits) as they received previously. Once the effects of timberland withdrawals on this idealized economy have been examined, the simplifying assumptions are relaxed, and more realistic results derived. Finally, the same course is followed for the regional level.

NATIONAL EFFECTS WITH INSTANTANEOUS ADJUSTMENTS

Figure A1.1 shows the national market for timber. D is the demand curve for harvested timber. The customers here are sawmills and plywood mills. S_0 is the supply curve of harvested timber prior to any withdrawal of timber tracts to conserve the spotted owl. S_0 includes both domestic and imported timber. In this initial situation, Q_0 is the amount of timber harvested, and P_0 is the equilibrium price (the stumpage price plus the cost of harvesting the timber).

Withdrawing Bureau of Land Management timber tracts with a harvestable volume of (Q_0 - Q') shifts the supply curve to the left from S_0 to S_1. (Throughout this discussion all diagrams are illustrative, and do not reflect the magnitude of the variables and the changes under consideration. In particular, the size of the timber withdrawal relative to the total market for timber and any change in the stumpage price have been greatly exaggerated.) The withdrawal of tracts produces an unstable market situation. At price P_0 and a supply of Q' there is an excess demand for timber (Q_0 - Q'). This excess demand drives the price up, inducing some timber suppliers to harvest more timber. New supplies of timber (called the timber response) are attracted onto the market until a new equilibrium price and quantity is reached at P_1 and Q_1.

The magnitude of the timber response depends on a number of things, including the age distribution of the timber stock. The fewer the number of trees of harvestable age, the more limited the timber response, the more vertical S_1, the smaller the difference between Q_1 and Q', and the larger the price rise from P_0 to P_1.

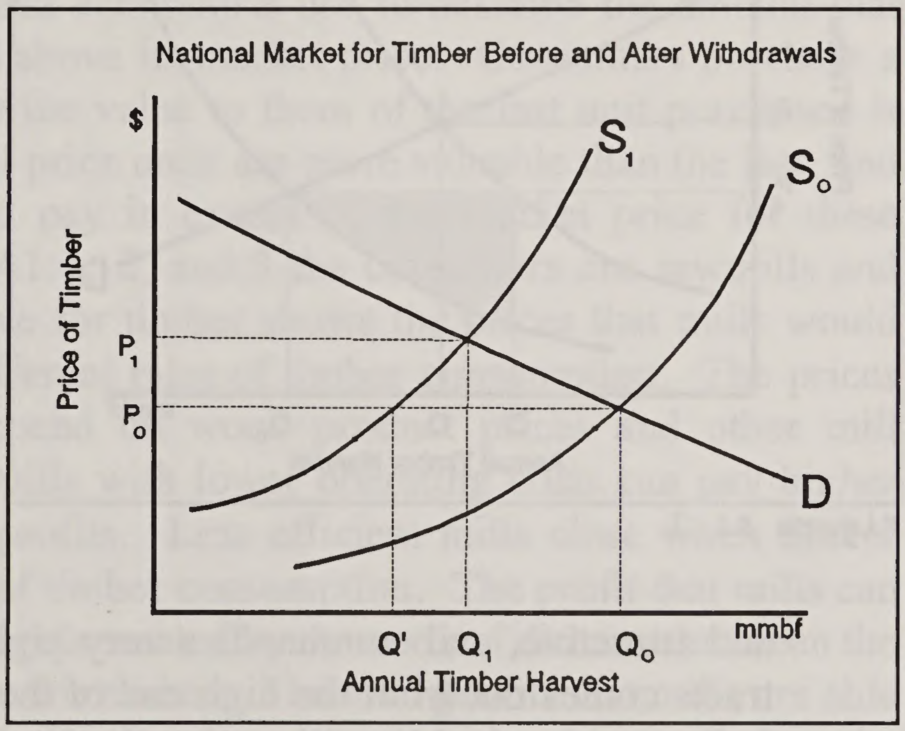

Figure A1.1

At the new equilibrium the nation's timber harvest for the year has been reduced from Q_0 to Q_1. In the rapid adjustment paradigm, the full cost to the nation of setting aside these timber tracts to conserve the spotted owl can be measured entirely within the market for logs. Although loggers and mill workers become unemployed as a result of the reduced harvest and the increased price for logs, they find new employment quickly and easily at approximately their original wage. Mills which go out of business (or contract their production) because of the increased price of timber transfer easily to other industries, the capital embodied in the mills converting easily to the production of other products. This conversion yields essentially the same profits that the capital assets were earning before the tracts were set aside. Finally, industries complementary to the timber industry (firms that service mills and timber harvesters, firms that use lumber, such as home builders and furniture makers, and firms that service firms that use lumber) will experience either reductions in demand or increases in cost, and hence contract. Industries which produce substitutes for wood (plastics, brick, other fabricating materials) will experience increases in demand and will expand. But all of the affected resources are assumed to adjust quickly, locate new occupations, and suffer no decline in earnings. If these assumptions are met (full employment and instantaneous adjustments), the nation's only change in productive capacity comes in the timber industry as a result of devoting timberland to the conservation of the owl instead of to timber harvesting.

The cost of this productivity change can be measured by the changes in the market for timber alone. This cost has three components:

- **The stumpage value of the timber:** This is the price that timber harvesters are willing to pay for the right to cut the timber. The gross value of a unit of timber in our example is P_o, and the net value or stumpage value is P_o less the cost of harvesting that unit, i.e., the vertical distance between P_o and the supply curve, S_o. Normally, when a market contracts (as when the price of a resource has increased and all producers are faced with higher costs), it is the least efficient units which are forced out. If that were the case here, the stumpage value of the reduced harvest, Q_o - Q', would be the shaded area in Figure A1.2. But that is not the case here. Old-growth Douglas fir is among the most valuable timber in the world. The trees are massive, and hence there is more wood per acre and per tree than on most second growth stands. The wood is strong, knot-free, and attractive, and commands a very high price. Thus, the withdrawal of timber tracts comes not from the high end of the supply curve, but from the low end. It is the most valuable rather than the least valuable logs that have been withheld from the market.

  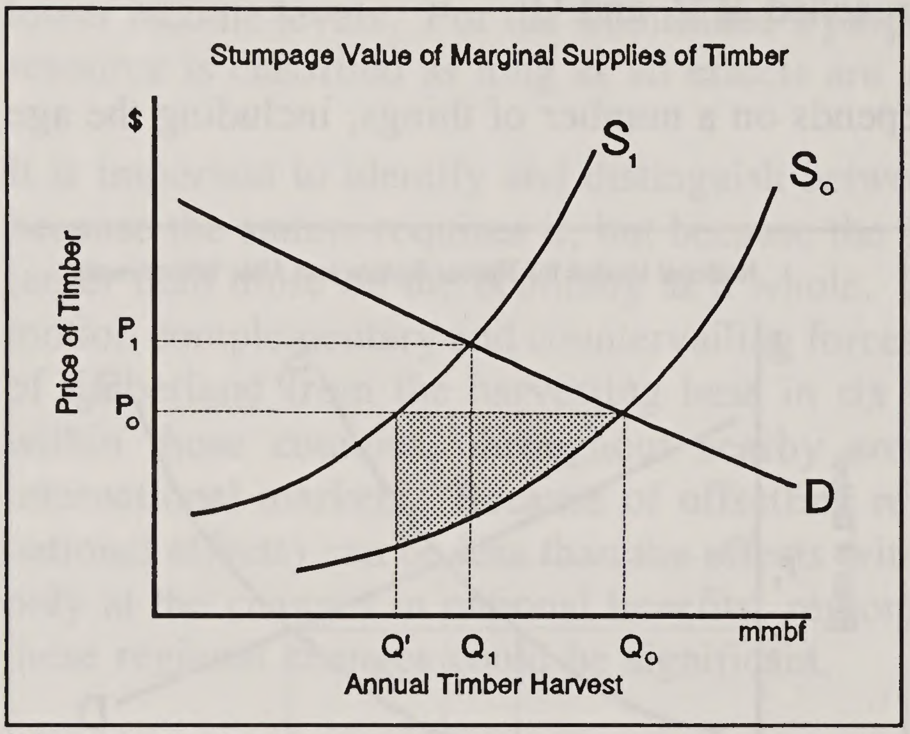

  Figure A1.2

  This is depicted in Figure A1.3, where $Q_w = (Q_o - Q')$ has been removed from the timber base, shifting the supply curve from S_o to S_1. The unit cost of harvesting these trees is C_o, and the forgone stumpage value of the withdrawn tracts is given by shaded area $A = (P_o - C_o)Q_w$. (It can be shown that area A is equal to the unshaded area between S_o and S_1 below P_o.) A constant cost for harvesting the withheld tracts was assumed in order to simplify the exposition. In fact, the tracts will be drawn from various places along the supply curve, producing a ratcheted effect. When the tracts are drawn from various locations along the supply curve, the forgone stumpage cannot be represented by a rectangle like area A, but rather by the sum of a series of disconnected elements.

- **The increased cost of the timber response:** Excess demand drove the price for timber from P_o to P_1, resulting in a timber response of $(Q_1 - Q')$. But the timber being attracted onto the market is either more expensive to harvest or the wood is not as good, and hence has lower stumpage value than the timber it is replacing. This results in additional harvesting costs equal to shaded area B.

  As depicted in Figures A1.2 and A1.3, the trees harvested in the timber response are marginal, are only worth harvesting at prices above P_o, and only have stumpage value above P_o. They do have stumpage value, however, and this stumpage value serves as an offset to area A. In the short-run, the stumpage benefit associated with a timber response comes from accelerating harvests which were planned for a few years later. Hence, the gain to the nation is the value of the timber harvested today less the present value of the forgone future harvests.

- **The consumer's surplus associated with the reduced volume $(Q_o - Q_1)$:** Consumer's surplus is the term that economists use to describe the amount that consumers value a good over and above its market price. Consumers purchase a commodity up to the point where the value to them of the last unit purchased is just equal to the market price. All prior units are more valuable than the last, and if they had to, consumers would pay in excess of the market price for these inframarginal units. In Figures A1.1, 2, and 3 the consumers are sawmills and plywood mills. The demand curve for timber shows the prices that mills would be willing to pay for timber at different rates of timber consumption. The prices that mills are willing to pay depend on wood product prices and other mill operating costs. More efficient mills with lower operating costs can pay higher prices for timber and still make profits. Less efficient mills close when timber prices are high, reducing the rate of timber consumption. The profit that mills can make on a particular timber unit is represented by the vertical distance between the demand curve and the market price for timber. The total profits that mills are able to make on the total quantity of timber purchased is given by the area below the demand curve and above the market price for timber. In Figure A1.3, shaded area C is the lost profits by mills on the reduction in the equilibrium volume of timber from Q_o to Q_1.

In an economy that adjusts quickly, these are the only economic costs to the nation of converting timberland to owl habitat. These costs may be passed on and reflected in the price of products that use wood, but in determining the magnitude of the costs to society, one cannot add the increased costs of final products to the increased costs of the resource (timber) used to make the final products and get a meaningful number. Accumulating in this way is called double counting. One determines the cost to society either by adding up the changed values of final products or by identifying the increased costs in the initial markets (the timber market), but not by doing both and adding the results together.

Distribution of the Costs

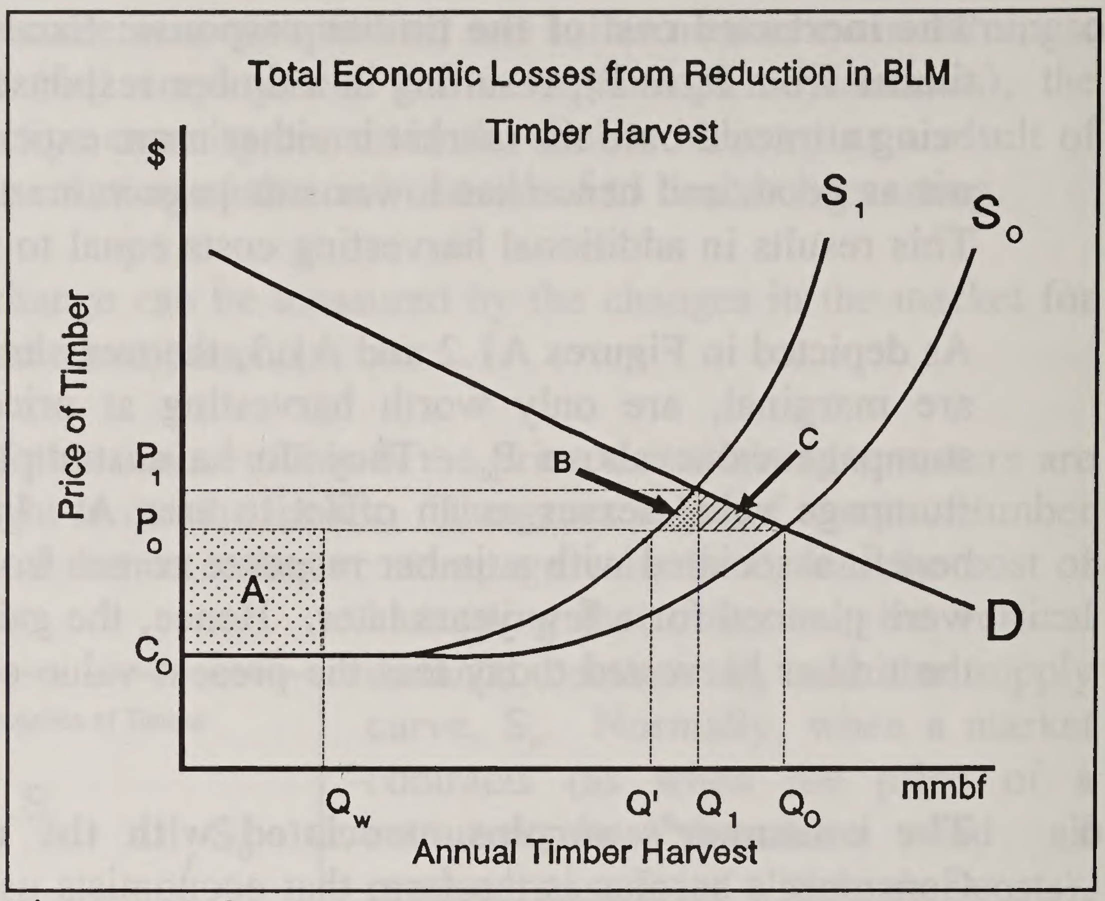

Figure A1.3

The costs of reserving timberland as owl habitat are not borne evenly throughout society. Some groups lose and some benefit, while many are only marginally affected. Owners of State and private timberland benefit in the form of higher profits due to the increase in the price of timber. Those who share in the receipts from Bureau of Land Management timber sales (taxpayers in general and residents of the O&C counties) gain from the increase in the price of timber, but they also lose as a result of the reduced harvest on Bureau of Land Management lands. Owners of mills suffer reduced profits as a result of the higher price for logs, and consumers of wood products pay higher prices for the goods which they consume. The rise in the price of wood and wood products increases the demand for substitutes, resulting in increased incomes for those engaged in their production.

In Figure A1.3, area A is the stumpage value of Q_w, the reduced timber harvest on Bureau of Land Management lands. From 1960 to 1990, the Federal Treasury and the O&C counties shared the gross timber revenues from Bureau of Land Management lands equally. Hence, the forgone stumpage revenue was a cost borne equally by taxpayers in general and residents of the O&C counties. Since there are many more Federal taxpayers than residents of O&C counties, the per capita burden was greater for the O&C county residents. Starting in 1990, however, Congress placed a floor under the O&C share, insulating the counties from much of the current revenue loss. For FY 1991, the counties are guaranteed 90 percent of the average revenue which they received during the last three years, and for FY 1992, 90 percent of the average for the previous five years. (There is an exception. The counties are not guaranteed more than the total O&C timber sales revenues for 1991 and 1992, respectively. If the sales revenues fall so precipitously that they are less than the calculated guarantee, then the counties receive all the revenues.) For a more complete discussion of the cost-sharing formula and the guarantee, see Chapter 2 (Regional Value of the Stumpage) and Chapter 4 (Background on Revenue Sharing with Oregon Counties).

As discussed above, area C in Figure A1.3 is the profit lost by mills as a result of the equilibrium level of timber harvest contracting from Q_o to Q_1. Thus, this cost is borne by mills.

Area B is the increase in the cost of harvesting the least valuable (marginal) supplies of timber (Q_1 - Q'). Area B is a resource cost that must be paid in order to attract additional timber supplies onto the market. It is initially incurred by harvesters, who in turn pass it on to mills, who ultimately pass it on to consumers of wood products.

There are other parties who gain and lose when Bureau of Land Management timberland is converted to owl habitat, but their gains and loses constitute only a transfer of wealth among groups, as opposed to a reduction in total production and an economic cost to the nation. These gains and loses cancel each other out. Prominent among them is the gain in profits which timber growers receive for Q_1, the new equilibrium harvest level, as a result of timber prices rising from P_o to P_1. These gains appear as shaded area D in Figure A1.4. These gains accrue to all growers of timber, public and private, and thus are shared by taxpayers as well as owners of timber companies. This increase in profits for timber suppliers is obtained at the expense of mills, which experience a loss of consumer's surplus (profit) equal to area D as a result of having to pay the higher price for Q_1.

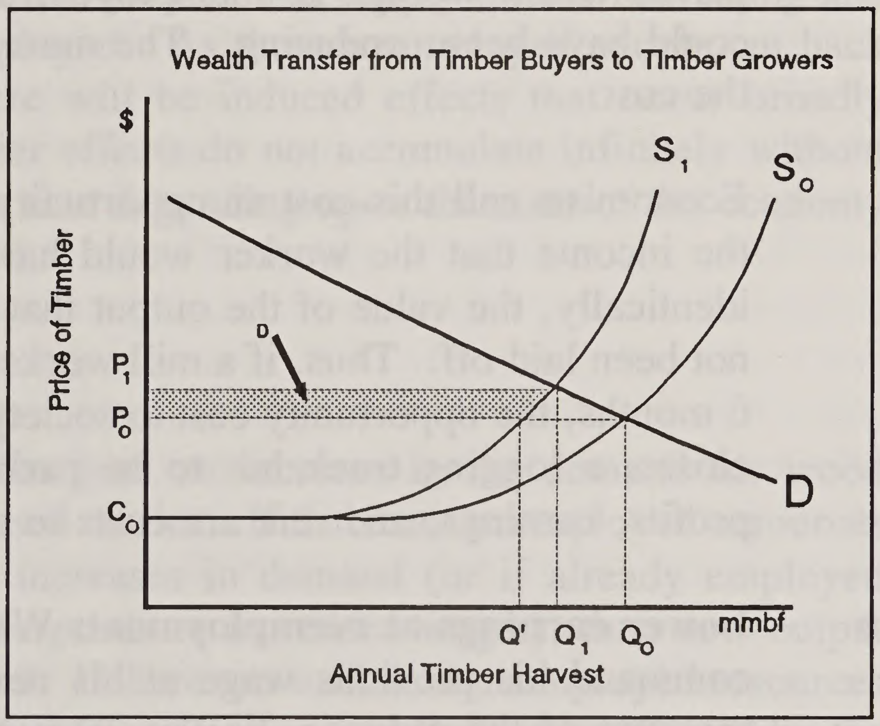

Figure A1.4

NATIONAL EFFECTS WITH LAGGED ADJUSTMENTS

Clearly, one would be hard pressed to find any markets that function as efficiently and as rapidly as those assumed above, let alone an entire economy. Relaxing the assumptions that markets adjust instantaneously and that displaced resources are able to relocate at approximately their previous level of earnings results in additional costs for timberland withdrawals.

In the preceding example, the only change that society experienced in its productive capacity came in the timber industry as a result of devoting timberland to the conservation of the owl instead of to timber harvesting. All resources displaced by the change were able to find new employment almost immediately. This means that the productive capacity of society over and above the withdrawn timberland was preserved and fully utilized. Hence, society did not forgo any output from these resources as a result of the change in the use of timberland. Furthermore, not only were these displaced resources never idled, but also the output which they produced in their new positions was essentially as valuable as that which they produced before being displaced, i.e., no decline in income.

With more realistic market assumptions, two additional sources of costs emerge from timberland withdrawals:

- **Idle resources:** Usually it takes awhile for displaced workers to locate new employment. This is so for all resources (land, labor, and capital), but for ease of exposition, the discussion is in terms of labor and wages. During the time period that a worker is unemployed, society losses the output that that person could have been producing. The more persistent the unemployment, the bigger the cost.

  Economists call this cost an opportunity cost, and measure the loss to society by the income that the worker would have earned had he not been displaced, or identically, the value of the output that the worker would have produced had he not been laid off. Thus, if a mill worker earning $10 per hour is unemployed for 6 months, the opportunity cost to society is equal to $10,000. Similarly, if a mill closes, a logging truck has to be parked, or a warehouse lies empty, the lost profits, earnings, and rent are costs to society.

- **Lower earnings at reemployment:** When a worker is reemployed, if he cannot command his previous wage at his new job, the difference in wage rates is a measure of the reduction in the value of his productivity. Thus, if a band saw operator who had been earning $10 per hour gets rehired at $7, the value of the lost output to society is $3 per hour multiplied times the number of hours he works at the reduced wage. Until the worker again finds employment at $10 per hour, the cost to society is the stream of wage differences.

Accumulating Costs Over Time

A dollar today is worth more than a dollar a year from now, because one can always invest today's dollar in an interest bearing instrument, and have more than a dollar a year later. To convert next year's dollars into their present value, one divides by one plus the interest rate. This is called discounting. One has to do the same thing with the streams of costs discussed above, the costs generated by withdrawals from the timber base.

Multiplier Effects

As indicated above, there are usually direct, indirect, and induced effects associated with converting timberland to owl habitat. In the previous example, where adjustments are instantaneous and displaced resources are immediately reemployed, the only costs associated with reductions in the timber base are the direct cost displayed in Figure A1.3. There are no indirect and induced costs, because contractions in some sectors are fully offset by equal and opposite expansions in other sectors. This is not the case when adjustments are lagged and unemployment persists.

When adjustments are lagged, the direct effects will be larger than those depicted in Figure A1.3. Resources displaced from the timber industry will not find employment immediately. Businesses and individuals that service and supply timber harvesting and processing firms will also become unemployed. As these unemployed people cut back on their consumption and spending, there will be induced effects that occur broadly throughout the economy. These multiplier effects do not accumulate infinitely without limit; they converge. Multipliers vary in size depending upon the state of the economy and the size of the region being examined.

Offsetting Effects

When the price of timber rises, it induces both an increase in the demand for wood substitutes and the timber response discussed earlier. If there are unemployed resources available to the firms which experience increases in demand (or if already employed resources are willing to work harder in response to increased wages), then new output will be produced in response to this demand. If there are sufficient unemployed resources or unused capacity, then all of the negative indirect and induced effects generated by the withdrawal of timber tracts can be offset by corresponding, induced increases in output and employment elsewhere. Thus, nationally only the direct effects identified in Figure A1.3 (areas A, B, and C) would remain. These direct effects cannot be offset by expansions which the adjustment process induces elsewhere. Society has had a reduction in its capacity to produce timber, and this reduction has a cost. Further, although the regional effects can offset themselves, the losers and gainers will not be the same people. Communities in Oregon would contract, and regions elsewhere (in and out of Oregon) would expand. Also, induced expansions occur with a lag, and thus, technically they would not fully offset the contractions that precede them. Since they occur later in time, their discounted value is smaller.

Distribution of the Costs

The direct costs identified in Figure A1.3 continue to be borne in the same way as they were in the instantaneous adjustment case. As noted, however, these direct costs are not the only direct costs experienced when adjustments are lagged. Resources formerly employed in the timbering industry in Oregon will experience unemployment. Most of the burden of the lost income will fall on these resource owners.

Some workers will be eligible for assistance from social programs, and as a result will be insulated from the full burden of the lost income. The cost of this assistance is borne by taxpayers in general. Unemployment benefits and other types of income assistance are a wealth transfer between two groups in society (the taxpayers and the beneficiaries), and the gains cancel the losses. Such transfers do not constitute a cost in the sense of lost productivity. Programs which accelerate the process of retraining and relocating displaced workers are an in-kind transfer from taxpayers to beneficiaries, but these programs have both an economic cost and an economic benefit. They have a cost because they draw resources from other productive activities to produce the services involved. They have a benefit because they reduce the duration of unemployment and the extent of any reduction in wages.

The indirect and induced costs are distributed in commodity markets and geographically throughout society. As such they cannot be depicted in a supply and demand diagram of the timber market alone. A proliferation of diagrams reflecting changes in markets nationwide would be needed, and any benefit from the simplified presentation would be lost in the complex array of figures. These costs are widely dispersed, and their per capita impact is likely to be small nationally relative to the regional and local per capita effects.

REGIONAL EFFECTS WITH INSTANTANEOUS ADJUSTMENTS

Because of the assumption of instantaneous adjustments with no loss of earnings this is not a very interesting case. The results are not significantly different from the counterpart national case, but it is addressed for completeness.

The direct costs are exactly the same as in the national case (see Figure A1.3), and they are borne in the same manner. Since displaced workers locate new positions immediately at approximately their previous wage, there is no economic burden for them to bear. There may still be indirect and induced effects on Oregon counties, however, depending upon where the displaced workers are reemployed. If the workers find work within the original region, then the regional economy will not shrink. If they have to relocate geographically to find new employment, then the original region will shrink economically, and the regions where the displaced workers resettle will grow. Workers would not suffer any significant economic deprivation; they would simply move quickly to a new region and a new occupation.

REGIONAL EFFECTS WITH LAGGED ADJUSTMENTS

When adjustments are lagged, it is the regional effects which tend to be the most troubling. The results parallel those of the "national/lagged adjustment" case except that nationally the indirect and induced costs may be reduced by offsetting responses, while for the Oregon counties there either are no offsets or they are delayed. If the regional economy is diversified and close to full-employment, the displacements may be temporary and short-lived. If displaced workers (and other resources) have transferable skills, the unemployment periods may be just temporary and wage reductions limited. If not, unemployment and income losses may be profound and persistent.

Because in the lagged adjustment case the impact of a timber withdrawal is so visible in the region, there is a tendency to infer that the multiplier effects are concentrated regionally. In fact this may not be the case, especially in relatively non-diversified, rural, timber-dependent communities. Such communities are far from self-sufficient. Many goods and services consumed within these communities are produced elsewhere and imported. The leakages of reduced demand (direct, indirect, and induced) due to a timber withdrawal are likely to be significant, and the full multiplier effects will be dispersed widely throughout the economy.

It is worth emphasizing that shrinkage in a region's economy is not sufficient evidence to conclude that displaced workers are suffering great deprivation. If workers move to another region and are quickly reemployed, the economic burden on them has been limited, as has the opportunity cost to society as a whole.

NON-MARKET EFFECTS

As indicated in the introduction to this appendix, there are non-market effects associated with harvesting the timber tracts in question, as well as with the alternative courses of action before the Committee. These non-market effects are environmental, recreational, and sociological in character. Although they are no less important than the market effects, they are not easily measured in dollar terms, and in some instances, not easily quantified at all. In many instances, "willingness-to-pay" surveys are used to attempt measurement of these effects. Designing the survey instruments is a difficult task, as is interpreting the results.

Environmental Outputs

Among the environmental outputs generated by old-growth forests are:

- Biodiversity. Although the spotted owl is the only old-growth-dependent species currently on the endangered species list, several other species in these forests are candidates for listing and are under review by the Fish and Wildlife Service or the

States, and one species (the marbled murrelet) has been proposed for listing by the Fish and Wildlife Service. Not all of these other species are exclusively old-growth dependent. Some are, but others are not, but have ranges which extend into the old-growth areas. In addition, concern has been voiced about a variety of anadromous fish stocks that spawn in the coastal drainages of the Pacific Northwest and depend to varying degrees upon the integrity of forest ecosystems to maintain their breeding habitat.

o Water quality. Shading provided by the forest stabilizes water temperature, and the forests roots system reduces erosion and sedimentation.

o Scenic beauty. Clearcut areas are obvious, not attractive, and often elicit negative comments. Forested vistas often prompt positive reactions.

People experience these and other forest attributes in a variety of ways. They visit the forests; look at photographs, television programs, and movies; read about the forests, talk about them, and dwell on them privately. For analytic convenience, researchers have tried to classify these activities as "use" and "nonuse," but the distinctions are rarely so apparent. For example, is looking at a photograph of an old-growth forest a use or a nonuse activity?

Recreational Benefits

Forests host a wide variety of recreational activities: hiking, camping, photography, horseback riding, hunting, fishing, sightseeing, and wildlife observation. Some of these activities can be revenue generating, if the frequency and intensity of use is sufficient to justify the management costs. Often, however, access to the forests to conduct these activities is not priced and sold, and then evaluating what are acknowledged to be beneficial uses becomes problematical.

Sociological Impacts

Any abrupt change in the way society is organized to conduct its activities has social costs, and rarely are the cost burdens and attendant impacts distributed uniformly throughout society. Job loss is often accompanied by elevated rates of diminished self-image, depression, anger, divorce, juvenile delinquency, family violence, substance abuse, and suicide. [Affidavit of Robert G. Lee, p. 13 and 22] Some of these effects are the reflection of reduced income and economic status; other effects are in addition to the income losses. Even those who do not suffer directly through loss of employment or income experience pain and are worse off because of the compassion that they feel for those who are suffering. These psychic impacts are as valid as those associated with the environmental amenities of the forests.

APPENDIX 2

Major Legal Guidelines for Planning and Management of Lands Administered by the Bureau of Land Management in Western Oregon

APPENDIX 2. MAJOR LEGAL GUIDELINES FOR PLANNING AND MANAGEMENT OF LANDS ADMINISTERED BY THE BUREAU OF LAND MANAGEMENT IN WESTERN OREGON

The following statutes and executive orders (as amended) constitute major legal guidance for planning and management of lands administered by the Bureau of Land Management in western Oregon. [BLM Exhibit 210]

Federal Land Policy and Management Act of 1976 (FLPMA)
The O&C Sustained Yield Act of 1937
National Environmental Policy Act of 1969 (NEPA)
Environmental Quality Improvement Act of 1970
Executive Order 11514, Protection and Enhancement of Environmental Quality (1970)
Taylor Grazing Act
Recreation and Public Purposes Act
Unlawful Inclosure or Occupancy Act
Mining and Minerals Policy Act of 1970
Mining Act of 1872
Minerals Leasing Act of 1920
Materials Act of 1947
Geothermal Steam Act of 1970
Geothermal Energy Act of 1980
Antiquities Act of 1906
Historic Sites, Buildings, and Antiquities Act
National Historic Preservation Act
Archaeological Resources Protection Act of 1979
Reservoir Salvage Act of 1960
Fish and Wildlife Coordination Act
Bald Eagle Protection Act
Sikes Act
Migratory Bird Treaty Act
Migratory Bird Conservation Act
Wilderness Act
National Trail Systems Act
wild and Scenic Rivers Act
Executive Order 11644, Use of Off-Road Vehicles on the Public Lands (1972)
Executive Order 11989, Off-Road Vehicles on the Public Lands (1977)
Wild Free-Roaming Horses and Burros Act
Coastal Zone Management Act of 1972
Endangered Species Act of 1973
Soil and Water Resources Conservation Act of 1977

Executive Order 11988, Floodplain Management (1977)
Executive Order 11990, Protection of Wetlands (1977)
Coastal Barriers Resources Act
Land and Water Conservation Fund Act of 1965
Federal Water Pollution Control Act
Safe Drinking Water Act
American Indian Religious Freedom Act
Resource Conservation and Recovery Act of 1976
Clean Air Act
Comprehensive Environmental Response, Compensation and Liability Act of 1980

APPENDIX 3

Explanation for Calculations

in Tables 2.3 and 3.1

APPENDIX 3: EXPLANATION FOR CALCULATIONS IN TABLES 2.3 AND 3.1

This appendix explains the derivation of several of the entries in Tables 2.3 and 3.1. Bruce Lippke provided one of the highest estimates for the possible extent of the timber response. His testimony was relied upon in deriving upper bound estimates for the variables.

1. TIMBER RESPONSE

Elasticity of demand and supply: Bruce Lippke provides the basis for the upper bound on the timber response (the increased supply of timber by private growers). He estimates that the increase in the price of lumber will result in a 10 percent loss of demand to substitute materials. [Affidavit of Bruce Lippke, page 5] Thus, he predicts that the market induced timber response will offset 90 percent of the timber losses.

Source of the response: Bruce Lippke estimates that 24 percent of this 90 percent response will come from the Westside, 27 percent from other U.S. growers, and 49 percent from imports. [Affidavit of Bruce Lippke, page 9] Thus, according to Bruce Lippke, the private, domestic timber response could offset 46 percent [=.9(.51)] of the stumpage withdrawal (22 percent from the Westside, 24 percent from other U.S. sources). Imports could replace 44 percent of the wood products, but not the timber. Therefore, estimating the employment effects is problematic.

Duration of the timber response: Like the other witnesses, Bruce Lippke does not believe that the private timber response is sustainable and that by the turn of the century, private growers will have to reduce planned harvests. [Affidavit of Bruce Lippke, page 9] Lippke together with these other testimonies were the bases for the assumption that the stumpage losses could be offset by accelerated harvest for 5-10 years. The witnesses were not specific about the number of years that the response could be sustained, so a 5-10 year range was used for the estimates in Table 3.2.

2. STUMPAGE VALUE OF THE DOMESTIC TIMBER RESPONSE

The entries in Table 3.2 indicate that by accelerating private harvests one can offset between 2.2 percent (five years at four percent) and 39 percent (10 years at 8.5 percent) of lost stumpage values. In deriving the percentage gains in Table 3.2, it was assumed that private timber growers would have to harvest a significant amount of acreage of young, rapidly growing trees. As a result, the sustainable private harvest in the future would have to be reduced: 19 percent after five years and 38 percent after 10 years. [Based on BLM Exhibit 189, page 2]

According to Bruce Lippke, domestic responses will only amount to 46 percent of the withdrawal. Thus, domestically they offset between one percent [=0.022(.46)] of the stumpage value, if the discount rate is four percent, and 18 percent, if the discount rate is 8.5 percent. In present value terms, \$10.4M at 8.5 percent and 10 years [=.18(\$58M)] and \$0.64M at four percent and five years [=.01(\$64M)]. Table A3.1 provides the present values of stumpage due to accelerated private harvest at two interest rates and two periods of sustainability for the timber response.

Table A3.1

Present Value of Stumpage due to Accelerated Harvests (In millions of dollars)

Interest Rate	5 yrs	10 yrs
4.0%	\$0.64	\$2.0
8.5%	\$5.5	\$10.4

3. STUMPAGE VALUE OF IMPORTS AND DIVERSION OF EXPORTS

There is no stumpage value offset from importing logs or lumber or diverting logs destined for export. There is, however, an employment offset, because the logs are being diverted or imported in order to be milled and satisfy the demand for lumber.

4. EMPLOYMENT EFFECT OF THE MARKET ALTERNATIVE

The market alternative includes all the responses by society due to the increased price of lumber stemming from the withdrawal of the 44 tracts.

For the portion of the private timber response involving domestic timber, log diversions, and increased supply of substitute materials, there may be close to a complete offset to the employment effects nationally, albeit at a small price increase for all of these. However, increased imports will not be associated with complete offset, because it is likely that milled wood products would be imported rather than logs. Conservatively, it was assumed that a board foot of lumber imports would only result in one-fourth of the employment associated with the domestic production being replaced. Thus, if imports are able to replace 44 percent of the timber, only 11 percent of the employment associated with this timber would be offset by imports. The total employment offset would be 57 percent (11 percent associated with imports, and 46 percent associated with the domestic timber response). Given that 48 percent of the private, domestic timber response might come from the Westside, about 22 percent of national employment losses would be offset within the region.

APPENDIX 4

List of Exhibits in the Hearing Record

APPENDIX 4. LIST OF EXHIBITS IN THE HEARING RECORD

BUREAU OF LAND MANAGEMENT

BLM-1	Northside Timber Sale Administrative Record
BLM-2	Fox Hollow Timber Sale Administrative Record
BLM-3	Moore Coon Timber Sale Administrative Record
BLM-4	Luts Breakout Timber Sale Administrative Record
BLM-5	Herb Cluster Timber Sale Administrative Record
BLM-6	Halfway Oxbow Timber Sale Administrative Record
BLM-7	Clabber Creek Timber Sale Administrative Record
BLM-8	Last Yankee Timber Sale Administrative Record
BLM-9	Green Cedar Timber Sale Administrative Record
BLM-10	Elk 24 Timber Sale Administrative Record
BLM-11	Chicken Deluxe Timber Sale Administrative Record
BLM-12	Bateman and Robin Timber Sale Administrative Record
BLM-13	Cross Out Timber Sale Administrative Record
BLM-14	Fall Apart Timber Sale Administrative Record
BLM-15	King Smith Timber Sale Administrative Record
BLM-16	Brownson Headwater Timber Sale Administrative Record
BLM-17	Barneys Peak Timber Sale Administrative Record
BLM-18	Amberson Creek Timber Sale Administrative Record
BLM-19	Prego Timber Sale Administrative Record
BLM-20	33 and 1 Timber Sale Administrative Record
BLM-21	Weiss Road Timber Sale Administrative Record
BLM-22	Chopped Hamm Timber Sale Administrative Record
BLM-23	Young Leo Timber Sale Administrative Record
BLM-24	Lake Creek Timber Sale Administrative Record
BLM-25	Eddy Whittaker Timber Sale Administrative Record
BLM-26	Alma Ranch Timber Sale Administrative Record
BLM-27	Windy Timber Sale Administrative Record
BLM-28	Devore Mountain Timber Sale Administrative Record
BLM-29	Horse Heaven Timber Sale Administrative Record
BLM-30	Salty Dog Timber Sale Administrative Record
BLM-31	Pea Gravel Clay Timber Sale Administrative Record
BLM-32	Stennets Fawn Farm Timber Sale Administrative Record
BLM-33	Table Creek Timber Sale Administrative Record
BLM-34	Back in the Saddle Timber Sale Administrative Record
BLM-35	Kitchen Door Timber Sale Administrative Record
BLM-36	Rootballs Timber Sale Administrative Record
BLM-37	Tigger Too Timber Sale Administrative Record
BLM-38	Camas Valley West Timber Sale Administrative Record

BLM-39	Renhaven Timber Sale Administrative Record
BLM-40	Pita Ridge Timber Sale Administrative Record
BLM-41	North Sand Creek Timber Sale Administrative Record
BLM-42	Independence Timber Sale Administrative Record
BLM-43	Four Gates Timber Sale Administrative Record
BLM-44	Callahan 20 Cleanup Timber Sale Administrative Record
BLM-45	Westside Salem Record of Decision
BLM-46	Eugene Record of Decision
BLM-47	Roseburg Record of Decision
BLM-48	South Coast/Curry Record of Decision
BLM-49	Westside Salem Final Environmental Impact Statement
BLM-50	Eugene Final Environmental Impact Statement
BLM-51	Roseburg Final Environmental Impact Statement
BLM-52	South Coast/Curry Final Environmental Impact Statement
BLM-53	Westside Salem Management Framework Plan
BLM-54	Eugene Management Framework Plan
BLM-55	Roseburg Management Framework Plan
BLM-56	South Coast/Curry Management Framework Plan
BLM-57	1987 Spotted Owl Environmental Assessment
BLM-58	1987 Spotted Owl Record of Decision
BLM-59	Exemption sales display
BLM-60	Exemption sales and affected communities
BLM-61	Exemption sales analysis No. 1
BLM-62	Exemption sales analysis No. 2
BLM-63	Exemption sales analysis No. 3
BLM-64	Exemption sales analysis No. 4
BLM-65	Insert No. 1, sale No. 36, 37
BLM-66	Insert No. 2, sale No. 34
BLM-67	Insert No. 3, sale No. 35
BLM-68	Insert No. 4, sale No. 20, 24
BLM-69	Insert No. 5, sale No. 23, 25
BLM-70	Insert No. 6, sale No. 2, 21
BLM-71	Insert No. 7, sale No. 1, 3, 5, 6, 7, 27
BLM-72	Insert No. 8, sale No. 18, 40
BLM-73	Insert No. 9, sale No. 41
BLM-74	Insert No. 10, sale No. 4
BLM-75	Insert No. 11, sale No. 17, 28, 39, 42
BLM-76	Insert No. 12, sale No. 32
BLM-77	Insert No. 13, sale No. 33
BLM-78	Insert No. 14, sale No. 43
BLM-79	Insert No. 15, sale No. 12
BLM-80	Insert No. 16, sale No. 9, 10, 44
BLM-81	Insert No. 17, sale No. 8, 11, 13, 14, 15, 16

BLM-82	Insert No. 18, sale No. 19, 38
BLM-83	Insert No. 19, sale No. 29, 30, 31
BLM-84	Window A/1
BLM-85	Enlargement, Sale 36, Sale 37
BLM-86	Window B/2
BLM-87	Enlargement, Sale 34, 1 of 2
BLM-88	Enlargement, Sale 34, 2 of 2
BLM-89	Window C/3
BLM-90	Enlargement, Sale 35, 1 of 1
BLM-91	Window D/4
BLM-92	Enlargement, Sale 20, 1 of 3
BLM-93	Enlargement, Sale 20, 2 of 3
BLM-94	Enlargement, Sale 20, 3 of 3
BLM-95	Enlargement, Sale 24, 1 of 1
BLM-96	Window E/5
BLM-97	Enlargement, Sale 26, 1 of 1
BLM-98	Enlargement, Sale 25, 1 of 1, Sale 23, 1 of 2
BLM-99	Enlargement, Sale 23, 2 of 2
BLM-100	Window F/6
BLM-101	Enlargement, Sale 2, 1 of 1
BLM-102	Enlargement, Sale 21,1 of 2
BLM-103	Enlargement, Sale 21,2 of 2, Sale 22, 1 of 1
BLM-104	Window E/7
BLM-105	Enlargement, Sale 7, 1 of 2
BLM-106	Enlargement, Sale 7, 2 of 2, Sale 6, 1 of 1
BLM-107	Enlargement, Sale 3, 1 of 2
BLM-108	Enlargement, Sale 3, 2 of 2, Sale 27, 1 of 2
BLM-109	Enlargement, Sale 27, 2 of 2
BLM-110	Enlargement, Sale 5, 1 of 1
BLM-111	Enlargement, Sale 1, 1 of 1
BLM-112	Window H/8
BLM-113	Enlargement, Sale 18, 1 of 2
BLM-114	Enlargement, Sale 18, 2 of 2, Sale 40, 1 of 1
BLM-115	Window I/9
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BLM-186	Final Version of the Northern Spotted Owl Analysis by Richard F. Johnson dated May 29, 1987
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NFRC-2	Memo from Jon Bart, Northern Spotted Owl Recovery Team, to Members of the advisory committee for users of Kevin McKelvey's computer model, regarding topics for discussion at August meeting, 7-24-91
NFRC-3	October 2, 1991 memo from Assistant Regional Director of Fish & Wildlife Enhancement regarding Northern Spotted Owl Guidelines for Compliance with the Endangered Species Act
NFRC-4	FWS Response to NFRC's First Set of Interrogatories, Requests for Production and Requests for Admissions
NFRC-5	FWS Response to NFRC's Second Set of Interrogatories and Request for Production
NFRC-6	Letter to Jerry Hutchins from the U.S. Fish & Wildlife Service, 12-18-91
NFRC-7	"Procedures Leading to Endangered Species Act Compliance for the Northern Spotted Owl" issued by the Fish & Wildlife Service
NFRC-13	"Summary Final Spotted Owl Critical Habitat Designation, January 1991"

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OLC-2	Spriggs, M.T. and Albaum, G.S., "Estimation of Economic Multipliers for the Oregon Wood Products Industry," September 1990

FISH AND WILDLIFE SERVICE

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FWS-5	Instruction memo from the State Director of BLM to all Westside District Managers regarding preparation of FY 1991 timber sale plans ("FY 1991 Instruction Memo")
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FWS-9	Memo to Marvin L. Plenert, Regional Director, U.S. Fish & Wildlife Service, from the Oregon State Director of BLM, regarding the injunction on implementation of the Jamison Strategy used by the district court in Lane County Audubon Society v. Jamison, with the District Court opinion and BLM list of 41 FY 1992 timber sale consultations attached
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FWS-65	Oregon Employment Division, "Oregon Resident Labor Force, Unemployment, Employment, & Nonagricultural Wage and Salary Employment, 1990"
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FWS-67	Pages 2 and 54 of Washington State Employment Security, Labor Market and Economic Analysis Branch, "Labor Force and Employment in Washington State"
FWS-68	"Investing in Dislocated Families: Developing a Legislative Program for Timber-Dependent Communities and for Dislocated Workers and Families in Oregon," authored by Ed Whitelaw and Ernest Niemi
FWS-69	USDA Forest Service and USDI Bureau of Land Management, "Actions the Administration May Wish to Consider in Implementing a Conservation Strategy for the Northern Spotted Owl"
FWS-70	"Employment and Community Stability in the Forest Products Industries," authored by Julie Gorte and Ross Gorte
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FWS-86	Draft preliminary annual report 1991, 1-24-92, "Demographic Parameters of the Spotted Owl at Coos Bay BLM District in Southwestern Oregon," by Dr. Cynthia J. Zabel and Dr. Barry Noon, Pacific Southwest Forest and Range Experiment Station (PSW), Arcata, CA 95521
FWS-87	"Conservation Planning for Species Occupying Fragmented Landscapes: The Case of the Northern Spotted Owl," by Kevin McKelvey, Barry R. Noon, and Roland H. Lamberson, 1-3-92
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FWS-91	"Demographic Analysis of Northern Spotted Owl Populations," draft, by David R. Anderson and Kenneth P. Burnham, Colorado Cooperative Fish and Wildlife Research Unit, Colorado State University, "Northern Spotted Owl," BLM document dated 5-8-86

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FWS-93	Hyde, William F. and Daniel, Steven E. and Wear, David N. "Distributive Effects of Forest Service Attempts to Maintain Community Stability." Forest Science. March 1991: 245-260.

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PAS-12	"Alternatives for Management of Late-Successional Forests of the Pacific Northwest, A Report to the Agriculture Committee and The Merchant Marine and Fisheries Committee of the U.S. House of Representatives by The Scientific Panel on Late-Successional Forest Ecosystems," 10-8-91
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